SAGUAROLAND BULLETIN

JANUARY, 1977

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Cover: *Yucca faxoniana*. Photo W. H. Earle

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Editor, Lillian Diven

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News & Notes

With the first issue of 1977, the Bulletin has a new cover. Over the years we have accumulated excellent photographs that did not lend themselves to use in the old format. Now, enlarged for the cover, pictures can show in greater detail and with more impact many handsome aspects of desert plants and landscapes.

We'd also like to start the year by inviting Garden Members to become "cover photographers." If you have shot a sharp black and white print of an appropriate cover subject, we'd like to see it. If it's used, we'll publish your name, too.

Some big magazines have elaborate photo contests. This isn't one, but it's a chance for Garden Members to share their pictures with other Members. We'd like, eventually, to use a different photographer each issue, so don't send us too many prints, just a few of your best. And don't send big enlargements. Snapshot size is adequate, as long as it's a glossy print.

* * *

In this issue you will find a Statement of Policy which we feel explains itself. What it means to our Members is that currently we do not have in stock at the bookshop any of the small boxes of cacti which have been so popular. We are now working with some growers and hope that one or more will begin to box their nursery-grown cacti, so that we can again offer a selection of packaged cacti.

* * *

New exhibits in the Garden include a collection of 100 species and varieties of **Lithops**. These fascinating pebble-look-alike plants replace the fine collection which was stolen several years ago. The purchase of the plants was possible when we found they were available, because there was sufficient money in the Plant Acquisition Fund established in memory of Clifford Schroeder.

Also new in the Garden is a demonstration hedge of Creosote Bushes and a display of Teddy Bear Cholla rescued from a Bureau of Reclamation project site with the Bureau's assistance.

* * *

One of our new Volunteers, Carolyn Hoppin, put her experience at the Krohn Conservatory in Cincinnati to work for us on her first day here. On behalf of the Garden — and the desert cacti of the Southwest — she prompted KOOL-TV to come out to

(Continued on page 7)

CREEPING HEDGEHOG
Echinocereus stoloniferus Marshall

Echinocereus stoloniferus is an unusual pectinate hedgehog cactus. The plants reproduce asexually as well as from seed. They have underground rootlike stems which appear at the ground surface some distance from the original stem and in time may become independent plants.

This cactus was first brought to the attention of science in 1934 by Radley, Bettencourt and Parsons. In 1935, W. Taylor Marshall, later Director of the Desert Botanical Garden, visited the site with a Mr. Bristol and made the collection which he (Marshall) ultimately designated as the type. It is now at the Dudley Herbarium of Stanford University.

A few months later, Howard Scott Gentry, our Garden's Research Botanist, was also in the area. He, too, collected the unusual cactus.

E. stoloniferus in flower at the Garden during July.

The type locality is "Mountain facing Guirocoba Rancho." For those unfamiliar with the geography of Sonora, Mexico, this is a ranch fifteen to twenty miles east of Alamos, which is in turn thirty miles east of the city of Navajoa, near the Sinaloa border.

The known range of the plant at the time the name was published was within a five-mile radius of the type locality. In recent conversations with Dr. Gentry, who wrote the classic flora of the region, he told me of seeing the plant in the canyons on the north side of the Sierra Saguaribo, thirty miles to the north of Rancho Guirocoba. Possibly the region harbors other populations as yet unknown. Dr. Gentry also stated that some time after the publication of the locality a friend reported that the population of this species and other cactus species in the area had been almost totally wiped out by collectors.

Specimens growing at the Garden have no data with them other than their accession number and the initials of Mr. Marshall after the name. The entry is undated, but the plants may be part of Marshall's personal collection, and therefore typical material.

In the field the plants are found growing on ledges, cliffs and rocky hillsides, in extremely open areas in a rich black humic soil. Plants in the Garden are cultivated in the partial shade of creosote bushes, where soil is enriched by the decaying compost of creosote leaves. We do not cultivate around the plants because the rhizomes may be injured or broken if cultivation is very deep.

The plants occur in clumps up to 30 cm across. Stems are up to 17.5 cm tall. Stems are grey-green and clearly visible between the 14 to 16 rows of spines, an unusual aspect in a pectinate hedgehog.

The oval 2-mm-long areoles bear brownish wool when young and are set

along the ribs at 5 mm intervals on ill-defined tubercles up to 6 mm high and 12 mm wide.

Spination consists of 10 to 12 semi-erect to lateral, spreading, bristle-like radials, and 3 to 5 centrals. Radials are black or red with white bases, becoming all white with brownish tips in time. Among the centrals, one is distinctly central and is deflexed from near the bottom of the areole. The remaining centrals are actually sub-central and originate from the upper part of the areole. They are difficult to differentiate from the radials.

The clear yellow flowers, plus the rhizomatous habit make this plant readily distinguishable from other hedgehogs. The other yellow-flowering species in the pectinate series of the Echinocerinae with which I am familiar, **E. ctenoides** and **E. dasyacanthus**, have larger flowers. Flowers of this plant emerge from the side of the stem, and the fruit is reddish and spiny, as is typical of the genus.

REFERENCES

H. S. Gentry, Rio Mayo Plants, plus personal communication.
W. T. Marshall, C&S Journal of America.
George Lindsay, C&S Journal of America.

—RGE

SOME EARLY WILDFLOWERS

Three of the earliest wildflowers in our central Arizona desert are also three of the most common. Prickly Poppy and Fiddleneck grow vigorously in disturbed soils, so are frequently seen along roadsides. The sturdy Desert Mallow, though less likely to be found in disturbed soil, grows in large numbers in the adjacent desert. All three are big enough to catch a driver's eye.

Prickly Poppy, **Argemone platyceras**, is sometimes called the Thistle Poppy, and does seem to combine characteristics of both plants. The tall stem, leaves, buds and seed capsules are covered with short, stiff spines quite unlike other poppies, though the large white flower is that of a true poppy. Prickly Poppy flowers bear a large center of orange stamens, and four to six large white petals that are often compared to tissue paper in texture, though cleansing tissue might be a better comparison, we think. The flowers are up to four inches across, the stems are two to three feet tall.

Flowering is most profuse in early spring, but Prickly Poppy can be found in bloom during most of the year in Arizona. It has statewide distribution at elevations from 1500 ft. to 8000 ft., and ranges from Nebraska and Wyoming south to Arizona and Mexico.

Fiddleneck is **Amsinckia intermedia**, a very abundant member of the Borage

Prickly Poppy

Fiddleneck

Family. An annual, it occurs in small and large groups of plants and in masses, especially after a wet winter.

The bright orange-yellow flowers are four-or five-lobed and are crowded on one side of long, curling spikes three to ten inches long. The flowers themselves are small "forget-me-nots" little more than one-quarter of an inch wide, but their abundance and bright color make them conspicuous. The plants are covered with minute stiff hairs which can irritate the skin of wildflower collectors. In normal years plants are between one and two feet tall, but after the winter rains of several years ago Fiddlenecks at the Garden grew to over three feet in height.

Fiddleneck is found in Arizona from the Grand Canyon south to the border at elevations under 5000 feet. It extends east to New Mexico and west to California.

Desert Mallow, **Sphaeralcea ambigua**, is another plant whose stems are covered with short hairs. These, too, can be irritating, and are the reason another name for the plant is "sore-eye poppy". It is no poppy, however, but belongs in the Mallow Family along with cotton and hibiscus, and the hollyhock whose flowers have a similar shape.

Most of the many-stemmed plants you will see, with their three-lobed, scalloped leaves, are likely to have cup-shaped apricot flowers, about an inch across. But there is a great variety in the colors, which can range from white through yellow, peach and lavender to bright red. Along the Pinal Parkway (Route 80-89) between Florence and Tucson you can find plants with flowers of five or more different shades in just a small area.

Desert Mallow grows in the central and southern counties of Arizona at elevations under 3500 feet. It is also found in southwest Utah, southern California and the states of Sonora and Baja California in Mexico.

These first spring wildflowers have one more thing in common. They start us thinking of the best springtimes we have seen, and planning picnics and hikes to see the desert in bloom.

REFERENCES

Kearney & Peebles, Arizona Flora
Parker, Arizona Weeds

——LD

Desert Mallow (Line drawings by Arthur Douglas from Marshall's *Introduction to Desert Plants.)*

Growing Cacti and Other Succulents under Fluorescent Lights

by Fran and Lee Tolleson

The Valley of the Sun is certainly the ideal climate for cacti and other succulents, but our very hot summers and our very bright sunlight are extreme for many succulents and even for some cacti. One way to grow and enjoy those more tender and sensitive plants is indoors under fluorescent lights.

We have been using fluorescent lights for this purpose for about two years, and we now have three home-made units of three shelves each. We use 40 watt (48 inch) Vita-Lite tubes which emit a full spectrum of light, including the ultraviolet. We can't say from personal experience that Vita-Lites are the best, because we haven't tried any other, but we can say they do promote good, normal growth and bloom in cacti and other succulents, and we have experienced very little etiolation, and that amount was probably because we had too much distance between the plant and the light source.

Our lights are hung on small chains, so the distance from lights to shelf can be varied to suit the size of the plants. We burn the lights about 16 hours a day (not expensive). We haven't gone into timers, which would simplify the turning on and off of the lights, or light meters, which would give us technical guidance, so we let the plants tell us what they want.

There are a number of good books available on the subject of growing all kinds of plants under lights, but not much available pertaining to cacti and other succulents only. There is an "Indoor Light Gardening Society of America", and they issue a bi-monthly publication, but again the information is of a general nature, rather than slanted toward our special interest. Two inexpensive and readily available sources of information are the Brooklyn Botanic Garden handbook "Gardening Under Artificial Light", which we bought at the Desert Botanical Garden bookshop, and Ortho Books' "The Facts of Light", which is available at most nurseries.

We have grown a wide variety of genera of both cacti and other succulents in our fluorescent light units, and even turned one large shelf into a nursery, where we were successful in germinating seeds, and we now are nurturing our beautiful little seedlings.

It has been an interesting and rewarding experience for us, and the results have been very encouraging.

Both of the Tollesons work with the plants Mrs. Tolleson exhibits so successfully in our Annual Cactus Show. She won her first trophy in 1972, and last year she garnered five trophies and two sweepstakes cups.

News & Notes (Continued)

to the Garden and film a story about an article in the current issue of **Retirement Living** which urged travellers to dig up desert cactus for souvenirs. We hope the resulting publicity warning visitors about Arizona's strict laws on protected plants will save both our plants and our visitors trouble.

* * *

Alice Feffer of our Board has long been our private goodwill ambassador to foreign botanical gardens. This year her trip to Iceland, Norway and Finland resulted in an exchange of seeds and of publications with the gardens she visited. At each of the gardens she received a cordial welcome, as we knew she would, since our own Garden staff is always happy to meet visitors from botanical gardens in other countries.

STATEMENT OF POLICY

The DESERT BOTANICAL GARDEN no longer sells field collected plants, plants removed from their native habitats. As an institution dedicated to the conservation of the wild flora of the world's arid lands, we feel that it is inconsistent with our stated goals to do so.

The current practice of indiscriminate removal of large numbers of native cacti, particularly those of the Chihuahuan Desert, in order to feed the demand for cacti as house plants and collectors' items, could ultimately lead to the extinction of many of our native cacti. In addition, the vast majority of the plants removed for sale are stripped carelessly from the ground and have little chance of successful reestablishment in the totally different environment in which they are eventually installed.

To draw the attention of visitors and collectors alike to the extent of this situation, we suggest reading the initial article in the July-August 1976 issue of the Cactus & Succulent Journal (Vol. XLVII No. 4).

Plants legally obtained as the result of necessary land clearing for highway construction and development are not at issue here. In fact, greater effort should be made to save these plants. It is the stripping of wild habitats of their native flora to which we object.

Unfortunately for the casual buyer, the conditions under which plants are removed from their natural surroundings are unverifiable, and until a system such as the one established by the State Legislature of Arizona is enacted and implemented in other states, the buyer will have to be judicious in selecting plants and plant dealers.

Purchasers of plants at the Desert Botanical Garden can be confident that all plants are nursery-propagated.

19 November 1976

MILDRED F. MAY
President of the Board
RODNEY G. ENGARD
Superintendent

Recent Field Trips

The Garden's field trip on November 13th was to Pinto Creek, off Highway 60 just west of Inspiration, Arizona. Twenty-nine Members and guests, led by Russ Haughey and Sherry Krummen, made the trip despite the bad weather. The forecast had called for snow down to 4000 ft., but though we were a little higher in elevation we saw only flurries on the surrounding hills.

Pinto Creek is in chaparral, so we saw many of the expected dominant plants for that zone, including shrub live-oak (**Quercus turbinella**), manzanita (**Arctostaphylos pungens**), red-berry buckthorn (**Rhamnus crocea**) and birch-leaf mountain mahogany (**Cercocarpus betuloides**).

There were only a few plants blooming in the cold weather: these were betony (**Stachys coccinea**), sweet clover (**Melilotus** sp.) and paintbrush (**Castilleja** sp.). The sugar sumac (**Rhus ovata**) had buds but no flowers yet.

We saw several small Arizona cypress (**Cupressus arizonica**) that impressed the group with its blue foliage. Several members discovered the wait-a-minute bush (**Mimosa biuncifera**) first-hand when it snagged their pants.

On the way back about half the group stopped at the Boyce-Thompson Southwest

Arboretum in Superior. It was warmer down at that elevation and we had an enjoyable time hiking the trails and browsing through the greenhouses.

The Garden had prepared a check list of the plants of the area, which proved very helpful to the trip members and to the leaders. We plan to make up check lists for all future field trips, and hand them out to participants before we leave the Garden. They will also be available after the trips for people who want to visit field trip areas on their own. There will be a charge of fifty cents per copy.

Twenty-six people led by Russ Haughey and Sherry Krummen went on the December 11 Field Trip. We made three stops in Estrella Mountain Park. First we walked along the bed of the dry Gila River. There we saw much Salt-Cedar, **Tamarix pentandra**, and Saltbush, **Atriplex spp**. A few Crownbeard, **Verbesina encelioides**, were in flower as well as Mohave Aster, **Aster abatus**, and Spectacle-pod, **Dithyrea wislizeni**.There were quite a few plants killed by frost in the river bottom, including Sacred Datura, **Datura meteloides**, and Devil's Claws, **Proboscidea sp.**, but the higher areas in the park showed no frost damage. There were many of the edible Mustard-grass, **Sisymbrium irio**, growing along the road in this area. Chester Oppen tasted some leaves and confirmed what the group had been told – that they had a hot, peppery taste, much like watercress.

After lunch the group walked up a dry wash. It was interesting to find that the ground was damp only a few inches deep here, even though our last rain was a month ago. There were many kinds of wildflowers coming up, including **Phacelia crenulata**; Goldpoppies, **Eschscholtzia mexicana**; Lupine, **Lupinus sparsiflorus**; several composites including Desert Dandelion, **Malacothrix glabrata**, Spanish Needles, **Palafoxia arida**, and **Perityle spp.**; Globe Mallow, **Sphaeralcea ambigua**; and mustards, **Dithyrea wislizeni**, **Descurania** sp., **Sisymbrium irio**, and **Lesquerella gordoni**. This should be a good spot for wildflowers this spring.

We saw a lot of wild Cucumber, **Marah gilensis**, twining through the trees along the wash. **Marah** has small white flowers and a spiny, cucumber-smelling fruit. The tomatillo, **Lycium andersonii**, was in bloom and a few bushes had ripe berries already.

——SCK

OUR HERBARIUM: An Annual Report

Our herbarium continues its growth and our collections now exceed 15,000 specimens. This is an increase of approximately 2000 numbers and the following brief statistical summary will reveal the source of some accessions during the past year. We received 312 specimens in our continuing exchange programs with other institutions and the contributions to our herbarium numbered 402. The most noteworthy one was a collection of 215 specimens collected in Mohave County by Jack Whitehead. Mohave County was poorly represented in our herbarium and this gift partially remedies that lack. A special contribution of 890 specimens from Northeast Louisiana University was one result of your curator's continuing interest in the genus **Carex**. The herbarium at that institution contained 475 unidentified specimens of that sedge and the curator there offered us this large collection of miscellaneous numbers if the writer were to identify this questionable material. Your curator accepted this offer and the project was completed in April to the mutual satisfaction of both of our institutions. Our herbarium now contains 229 species of the approximately 500 Carex known in North America and probably this is its largest representation in any herbarium in the Southwestern States. Of course, these

additions meant we were "bursting at the seams" but this situation was alleviated early in November when your Executive Board approved the purchase of three more herbarium cases.

——J. Harry Lehr

The National Resources Collections Group

In the June-July issue of the Bulletin, it was announced that our herbarium had been named a "National Resource" by the Association of Systematic Collections. Our inclusion in the group was the result of a survey undertaken in 1973 by their Advisory Committee for Systematic Resources in Botany. The purpose of that survey was to analyze the resources of each of the more than 1100 herbaria in the United States and an eight-page questionnaire was sent to each of them. At the conclusion the herbaria were ranked according to index values related to the nature and size of their holdings and facilities and to the activities of the staffs. Using a ranking of 40 points, all those institutions who scored 12 points or better were recognized as the National Resource Collections Group. In all, 115 herbaria achieved this recognition. The results were then presented to the National Science Foundation, who had funded the project. Four institutions in our State were awarded this honor and we ranked third in this group preceded by the University of Arizona and Arizona State University. Northern Arizona University was ranked fourth in this State's grouping.

Contributing to our standing was the presence in our herbarium of the George E. Hinton collection of Mexican plants, the Rose Collom collection of Arizona natives, Dr. Gentry's collection of Agaves, and your writer's collection of the Carices.

——J. Harry Lehr

Cactus Show Volunteers

The Cactus Show is nearly here—February 20th through February 27th. We're reprinting the Volunteers' Check List. You know by now how much your help is needed! Will you phone and let us know what jobs you'll do now and during the Show?

( ) Pre-show mailings
( ) Typing
( ) Filing
( ) Sales in Shop
( ) Selling Nature Walks
( ) Restocking in the Shop
( ) Registering entries before Show
( ) Mailing, stuffing envelopes
( ) Tabulating the Show
( ) Listing entries, exhibitors
( ) Figuring totals during Show
( ) Helping set up Show
( ) Acting as host, hostess
( ) Being guard or 'traffic cop'
( ) Helping with publicity
( ) Keeping attendance count
( ) Answering visitors' questions
( ) Lettering, posters, etc.
( ) Distributing posters
( ) Handling phone calls
( ) Miscellaneous chores
( ) Running errands.
( ) Anything at all!

How many days a week? On weekends? An occasional evening? When? Now? During the Show? After? Call 947-2800.

Chuck Merbs, in charge of the Show Week plant sale, wants Volunteers right now to put up plants, to donate extra cactus and succulents from their gardens, to contribute fresh and (accurately) named cactus seeds, and to gather these things for the sale: shopping bags and smaller ones, clay and plastic pots, yogurt containers and the like, and small boxes. Please bring them to the Garden.

Jardin Exotique, Monaco

(The fourth of W. Hubert Earle's reports on botanical gardens in Europe)

How would you like to build a garden on the side of a cliff, a forty-five degree slope of almost solid rock with no soil or water? This is the site of the Jardin Exotique of Monaco where visitors today can gaze up at or down on one of the finest collections of cacti and succulents in the world.

Created by Prince Albert, grandfather of Prince Rainier, the garden was officially inaugurated in 1933 by his son and successor Prince Louis II.

Holes had to be blasted out of the cliff face and filled with soil before any planting could be done, and the attrition of the soil over the years has recently necessitated temporary removal of the tall cacti and succulents in order to replenish their soil, but the location of the Jardin Exotique provides the best possible conditions for growing succulents, and the Garden is a dazzling sight.

Plants develop rapidly here. Monaco is backed by tall mountains that screen the winter winds, the steep cliff face catches the winter sun, and the water of the Mediterranean adds needed humidity to the air. Even cold-sensitive plants need no protection.

The Garden prospered under the directorship of Louis Vatrican, who recently retired, and is now directed by his former assistant, M. Marcel Kroenlein who continues to develop the collection.

Recently two multi-level glasshouses have been built beside the propagating houses. They will be open to the public this winter, but when Jurg Rau and I visited the Garden in May the entrance steps were not as yet installed and we had to climb over scaffolding for our private viewing of the superb plantings. The Garden is closed to the public at noon, and that was the time we were given the liberty of the Garden to see, explore and photograph. The narrow sinuous paths and tall Cerei made it very difficult to take pictures. No photographs I have seen do justice to this wonderful place.

The Jardin Exotique has acquired a number of outstanding private collections of cacti, including the many cacti Curt Backeberg collected preparatory to writing his "Die Cactaceae".

The I.O.S. Congress will convene in Monaco in May, 1978, and participants will have the treat of seeing the Jardin Exotique. Your writer looks forward to the meeting and the chance to see this fine Garden again.

DESERT BOTANICAL GARDEN

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GARDEN EVENTS

JANUARY

Tues.	**4th**	CACTOMANIACS—Meeting	**8:00 p.m.**
Wed.	**5th**	CLASS—Introduction to Desert Plants	**2:30 p.m.**
Thurs.	**6th**	LECTURE—Arizona Cacti in Flower	**3:00 p.m.**
Sat.	**8th**	FIELD TRIP—Picacho Peak State Park	**8:30 a.m.-4:45 p.m.**
Wed.	**12th**	CLASS—Succulent Plants	**2:30 p.m.**
Thurs.	**13th**	LECTURE—Arizona's Plants—Mountains to Desert	**3:00 p.m.**
Wed.	**19th**	CLASS—Cultivation of Succulent Plants	**2:30 p.m.**
Thurs.	**20th**	LECTURE—Arizona Wildflowers	**3:00 p.m.**
Wed.	**26th**	CLASS—Desert Trees and Shrubs	**2:30 p.m.**
Thurs.	**27th**	LECTURE—Mexican Cacti	**3:00 p.m.**
Sun.	**30th**	CENTRAL ARIZONA CACTUS & SUCCULENT SOCIETY	**2:00 p.m.**

FEBRUARY

Tues.	**1st**	CACTOMANIACS—Meeting	**8:00 p.m.**
Wed.	**2nd**	CLASS—Cultivation of Desert Trees and Shrubs	**2:30 p.m.**
Thurs.	**3rd**	LECTURE—Arizona Flowering Trees	**3:00 p.m.**
Sat.	**5th**	FIELD TRIP—McDowell Mtn. Park	**8:30 a.m.-4:45 p.m.**
Wed.	**9th**	CLASS FIELD TRIP—Carefree area	**8:30 a.m.**
Thurs.	**10th**	LECTURE—Cactus Flowers	**3:00 p.m.**
Sun. thru Sun.	**20th 27th**	THIRTIETH ANNUAL CACTUS SHOW	**Daily 9:00-5:00 p.m.**

Our monthly field trips are very popular, so early reservations are advisable. Prepaid reservations are necessary. Fee is $1.00 for Garden Members, $2.00 for non-members.

The Garden is open every day of the year from 9 a.m. to 5 p.m. Telephone 947-2800 or 946-9942.

30th Annual Cactus Show

presented by

THE DESERT BOTANICAL GARDEN

February 20th through February 27th, 1977

9 a.m. to 5 p.m.

In the Garden's Webster Auditorium
Papago Park, Phoenix, Arizona

SHOW RULES

Cacti and other succulents and allied material are eligible as listed in this schedule.

All plants must have been grown by the exhibitor for six months or longer. All plants must be labelled with appropriate botanical names.

The Committee reserves the right to reject plants or other entries if show regulations are violated, or if the exhibit is not up to standard. Rejected entries will not be displayed.

In Section I, Class A, and Section II, Class A, additional divisions may be set up when two or more exhibitors are represented, and a total of three or more specimens entered.

In Section VI, accessories are permissible, but exclude artificial foliage, artificial flowers, artificial color. Non-desert plant materials will not be considered as accessories.

In Sections VII and VIII, entries must be exhibitor's original work. All entries in Section VII must be mounted. All entries in Section VIII must be framed, ready to hang, and all watercolors and graphics under glass.

In Section X, elementary school students may enter as individuals or as a group, but are not restricted to this Section. If they choose, they may compete in other sections.

Exhibitors in Sections IX and XI must contact the Garden in advance to reserve space and to verify that exhibits are appropriate.

In Sections VI through XI, no entries previously exhibited in the show will be accepted.

The Desert Botanical Garden will exercise due caution and care in safeguarding the exhibits, but can assume no responsibility for loss or damage, or for unclaimed exhibits.

1-77

CLASSIFICATIONS

SECTION I CACTI

Class A. Individual Specimens. Limited to 3 entries per division.
— Divisions —

1. Ariocarpus, Aztekium, Obregonia
2. Astrophytum
3a. Columnar Cereus, North America
3b. Columnar Cereus, South America
4. Copiapoa, Parodia, Matucana
5. Coryphantha, Echinomastus, Escobaria, Neolloydia
6. Echinocactus, Ferocactus, Hamatocactus
7. Echinocereus
8. Echinopsis, Lobivia
9. Epithelantha
10. Gymnocalycium, Rebutia
11a. Mammillaria, pots up to 4''
11b. Mammillaria, pots over 4'', to 10''
11c. Mammillaria, pots over 10''
12. Melocactus, Discocactus
13. Neoporteria, Neochilenia
14. Notocactus
15. Opuntia, Pterocactus, Tephrocactus, Grusonia
16. Pediocactus, Toumeya, Utahia, Sclerocactus
17. Pelecyphora, Solisia, Turbinicarpus
18. Stenocactus
19. Thelocactus
20. Any other genus

Class B. Crested or Monstrose
Division 1. Own root
Division 2. Grafted

Class C. Grafted

Class D. Collections, 4 to 6 different species of a genus.

SECTION II SUCCULENTS OTHER THAN CACTI

Class A. Individual Specimens. Limited to 3 entries per division.
— Divisions —

1. Adromischus
2. Aeonium
3. Agave
4. Aloe
5. Anacampseros
6. Asclepiads, Stapelias, etc.
7. Conophytum
8. Cotyledon
9. Crassula
10. Echeveria, Dudleya, Graptopetalum, Sempervivum
11. Euphorbia
12. Haworthia, Gasteria, Astroloba
13. Kalanchoe
14. Lithops
15. Pleiospilos

16. Sedum, Pachyphytums
17. Senecio, Kleinia, Stylophyllum
18. Other Mesembryanthemaceae
19. Any other genus

Class B. Collections, 4 to 6 different species of a genus.

SECTION III SEEDLINGS

Class A. Cacti
Class B. Succulents other than Cacti
Class C. Desert Trees and Shrubs

SECTION IV DESERT TREES AND SHRUBS

Class A. Trees and Shrubs
Class B. Desert Bonsai
Class C. Caudiciforms

SECTION V PLANTERS, all rooted plants

Divisions applicable to Class A only; 1. Cacti. 2. Other succulents. 3. Cacti and other succulents.

Class A. Dish Gardens
Class B. Hanging Planters — cacti, other succulents, or both.
Class C. Patio Planters — cacti, other succulents, or both.

SECTION VI ARRANGEMENTS, no rooted plants. Limited to one entry per class in Classes A through F, one entry per division in Classes G through J.

Class A. Using Dried Arizona desert material, with desert bird or animal as an accessory.
Class B. Using dried Arizona desert material and weathered wood.
Class C. Using cacti, suitable for a coffee table.
Class D. Using succulents other than cacti, suitable for an entry hall.
Class E. Using cacti and other succulents, showing water interest.
Class F. All-green arrangement, featuring cacti, other succulents, or both.

Divisions applicable to Classes G, H and J: 1. Cacti, other succulents, or both. 2. Dried Arizona desert material.

Class G. Button arrangements
Class H. Miniature arrangements, under 5'' high
Class J. Corsages

SECTION VII PHOTOGRAPHY, desert subjects. Limited to two entries per division.

Divisions applicable to all classes: 1. Landscape. 2. Wildlife. 3. Plants.

Class A. Black and white prints
Class B. Color prints
Class C. Transparencies, 2x2 or 2 ¼ x 2 ¼

SECTION VIII ARTS, desert subjects. Limited to 2 entries in Classes A through D, 3 entries in Class E.

Class A. Oils
Class B. Watercolors
Class C. Graphics — included are: pencil, ink, charcoal, pastel, lithographs, serigraphs, block prints.
Class D. Mixed Media.
Class E. Botanical Illustrations, any medium.

SECTION IX EDUCATIONAL EXHIBITS

SECTION X JUNIOR CLASS, non-competitive

SECTION XI OPEN, non-competitive. Displays by clubs, societies, commercial growers.

REGISTRATION, ENTRY OF EXHIBITS, JUDGING

Registration Cards (one for each exhibitor) and Exhibit Cards (one for each exhibit) may be obtained from the Garden. Registration Cards must be filled out before Registration day. Exhibitors planning to enter five or more exhibits in the Show are required to fill out Exhibit Cards in advance, and all Exhibitors are encouraged to do so.

Write to **Desert Botanical Garden, P.O. Box 5415, Phoenix, AZ. 85010. Phone 947-2800.**

Exhibits will be accepted according to the following schedule. Exceptions will be made only for plant exhibitors who live more than 100 miles from Phoenix and have notified the Garden in advance.

ARTS AND PHOTOGRAPHY:
Monday, February 14, 9 a.m. to 5 p.m.
Tuesday, February 15, 9 a.m. to 10 p.m.

ALL OTHER SECTIONS:
Wednesday, Thursday and Friday, February 16-18, 9 a.m. to 10 p.m.

Juding will be held on February 19. The decision of the judges will be final. First, Second, Third and Honorable Mention ribbons may be awarded in each class or division. Trophies may be awarded in each class. Sweepstakes awards will be given to high-point exhibitors.

Exhibits may be removed only after 5 p.m. on February 27.

The following scale of points is used in judging these entries:

CACTI & SUCCULENTS SPECIMEN PLANTS	
Condition	50
Nomenclature	10
Rarity	10
Size or degree of maturity	15
Staging	15
	100

ARRANGEMENTS & PLANTERS	
Design	30
Color	20
Identification of material	10
Originality & distinction	30
Condition	10
	100

BUTTON & MINIATURES	
Scale	40
Design	30
Color harmony	20
Condition	10
	100

CORSAGES	
Technique	25
Design	35
Color	15
Combination of materials	15
Condition	10
	100

SAGUAROLAND BULLETIN

FEBRUARY, 1977

SAGUAROLAND BULLETIN

Vol. XXXI FEBRUARY, 1977 No. 2

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Cover: *Kalanchoe tomentosa,* a recent Cactus Show winner entered by Fran Tolleson. Photo W. H. Earle. (see page 21)

DESERT BOTANICAL GARDEN

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Editor, Lillian Diven

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News & Notes

Cactus Show time is nearly here. The early volunteers and the staff are busy repairing and preparing display tables and stands, readying equipment, working on publicity and other tasks necessary to make the Show a success. The Show Classification List was included in the January Bulletin, and registration forms were sent to past exhibitors. If you have never exhibited in the Show before, contact the Garden and we will send you the information you need. We will also be glad to answer any questions you may have about possible exhibits.

* * *

Chuck Merbs and Mary Getz, our plant sale committee, are busy acquiring, potting and labelling plants for the Show Week sale. They still need more plants and cuttings. If you have plants, cuttings, pots or containers of any description which you would like to donate to the sale, telephone Chuck at 839-4068 or drop them by at the Garden. Other needs are paper grocery bags and small cartons in which buyers may carry their new plant treasures home.

* * *

After KOOL-TV gave the Garden publicity in connection with that magazine story that urged travellers to dig up desert cactus for souvenirs, the CBS TV network picked up the report. Friends of the Garden in Detroit and New York City have told us of seeing the story on local television, so perhaps we will bring the cause of cactus protection to the public at last.

I am sorry to report that the field trips scheduled for this year are almost filled. February, March and April trips are completely booked, and the May field trip to Mount Ord has only five spaces left at this writing. We are training two more field trip leaders now so that next year fewer people will have to be turned away. Check lists of the field trip areas are new this year. We plan to have extra copies printed, so Members who want to explore those areas on their own can obtain copies.

On the happy side, however, is the fact that recent rains have increased our chances of having a good spring display of desert wildflowers. Our editor noted in November that the playa lake

(continued on page 20)

BACK AGAIN TO CEREUS

Cereus emoryi Engelm. has a long history of name changes which reflect its position as "an aberrant species of uncertain connections" (2). The plant has always borne the specific epithet **emoryi**, derived from the surname of Lt. Col. Wm. H. Emory, "the energetic and distinguished commissioner" (3) who led the American section of the United States and Mexican Boundary Survey team.

Although the species was attributed to the genus Cereus in the type description, it has been variously treated as **Echinocereus emoryi** by Rumpler and more recently as **Bergerocactus emoryi**, a monotypic genus erected by Britton and Rose.

The German botanist Alwin Berger (for whom Bergerocactus was named) noted that natural hybrids of this taxon and Myrtillocactus and Pachycereus occurred in the southern part of the plant's range. Orcutt also found these rare hybrids and they were subsequently published as new species, one of them bearing Orcutt's name as a specific epithet.

Recent experimental breeding work completed by Lyle A. McGill of the Arizona State University graduate school of botany has proved Berger correct. Some of the experimental crossings produced viable seed. On this basis, present authorities place all of these taxa — Bergerocactus, Myrtillocactus and Pachycereus — in the original genus Cereus.

Emory's party discovered the plants near the first international boundary monument south of what is now Imperial Beach in San Diego County, California, the type locality. Although California populations of the plant have been greatly reduced by urban sprawl, the plant can still be found in southern California. Originally reaching as far north as Ocenside, the mainland populations are now isolated clones. Engelmann, in 1880, reported the plants as being "abundant on rocky hills from Los Angeles to the Salinas Valley" (4).

At present the largest California populations are located in Cabrillo National Monument on the peninsula which protects San Diego Harbor and on San Clemente and other nearby islands.

As the above localities might imply, **C. emoryi** is a seacoast plant, found within a few miles of the Pacific Ocean from California south to a few miles south of Rosario in the Mexican state of Baja California del Norte. It occurs on dry and rocky hills, bluffs, cliffs and mountains in sandy soil where it forms patches up to seven meters square. The cylindrical stems are erect, ascending or procumbent. Colonies are formed by an individual plant sending out branches from below the surface of the ground. Also, as old stems fall, they may root along the lower sides and send up new stems. "Branches generally grow only for one season,

A 3-ft.-tall *C. emoryi* showing typical growth habit.

Showing the opuntia-like aspect of the stem and the varying spine lengths.

although sometimes it (sic) may send a second growth from the top and if injured may branch out at the point of injury. A matured branch will stand for several years and finally die . . ." (1).

Stems reach one and a half meters in height and may be up to 6 cm in diameter. The stems have 15 to 25 ribs two to three mm high, and are somewhat tuberculate. Areoles are so closely set that spines from contiguous areoles interlock, investing the bright stems with a cylinder of golden-yellow spines. In age these straight, thin, brittle spines become grey-brown and eventually black.

Each areole produces from 10 to 30 spines of unequal length, from 0.5 to 6 cm long. One to three of the spines are usually longer and more robust than the rest. The habit and character of the branches and spines give the plants the overall appearance of a rather scruffy Cholla (Cylindropuntia).

Flowering occurs from April to June. Generally, the flowers appear abundantly on the upper portion of only one side of the stems. Perhaps this is an early stage in the evolutionary development of a lateral cephalium.

The flowers, from 2 to 4.5 cm broad, are greenish-yellow with wide-spreading perianth which is persistent on the fruit. This last characteristic is one that "would seem to refer our plant to Echinocereus, but the seed and embryo permit no doubt about its position" (3). The corolla is short-funnelform, the tube bearing a few well-spaced uniform scales, these bearing in their axils areoles with slender spines and wool. Outer perianth segments are obovate and obtuse, from 5 to 8 mm long. Inner perianth segments are narrower, oblong, and about 1 cm long. Stamens are nearly as long as the inner perianth segments. The style, of approximately the same length, is surmounted by the linear stigmas.

The spiny red fruit is globose, up to 3.5 cm in diameter. Spines on the fruit may be up to 1.5 cm long.

One of the most unusual aspects of the plant is its manner of dehiscing. The fruit extrudes the seed and pulp from the distal end, leaving them in the open for dispersal, I presume, by animals. The seeds embedded in the red pulp are black, obovate, shining and minutely tuberculate, 2.5 to 3 mm long.

Seed would seem to be a good way to acquire the plant, as cuttings are reportedly difficult to root. If cuttings are

Fruit, on one side of stem, showing persistent dried perianth.

planted deep, the lower portion dries up and a callus forms above the dried portion. The plant then strikes root from the callused area. Once established, plants may be watered freely. The soil should be loose and sandy, with a high percentage of organic matter. Leaf mould is a good material to use. It is natural for stems to die, and dying stems should be removed as their condition becomes apparent. Remove them carefully to avoid damaging the developing stems below the surface.

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——RGE

House Plant Problems in Arizona

By Sherry C. Krummen

Whenever I read an article about house plants in a national magazine, I want to say, "No, that's not true here." With the increase in interest in growing plants indoors there is also an increase in the number of these articles, and I wonder if you are all aware of the problems that do occur in growing house plants here in Arizona.

The most obvious problem is the very low humidity. Most commonly grown house plants prefer 40-60 percent humidity. Contrast that with our relative humidity levels of 5-40 percent outdoors and remember that both heating and refrigeration lower these levels — down to 2-15 percent is common.

A second problem is our salty water. You've probably noticed the white crust that collects on the soil surface and the sides of clay pots after four or five waterings — this is simply a build-up of alkaline salts and is responsible for tip burn, brown leaf edges and the eventual death of plants here.

Some other difficulties we encounter in growing house plants are extremely high light intensities and heat during the summer. These combine to reverse our growing season from the norm elsewhere — my own plants grow like crazy fall through spring, and then go into a semi-dormant slump during the summer when conditions are just too severe for good growth.

What are the remedies? Most are obvious — increasing the humidity around your plants by frequent misting, placing them on trays of pebbles and water, keeping them in your bathroom or using a humidifier. Leach your pots often to remove salts. Keep plants in north or east windows during the summer months.

Most important, grow plants that can adapt to our severe conditions. I don't recommend that you even try to grow ferns unless you have a lot more time and patience than I have (or unless you're lucky enough to own a greenhouse). Cacti and other succulents are one good choice, but there are other, more exotic-looking plants that can be grown here with success and these will be discussed in future articles.

For Desert Gardeners: Glochids, Beetles, etc.

By Russell Haughey, Garden Horticulturist

What to Do about Glochids?

Prickly Pears are almost ideal landscape plants. They are easy to grow, easy to propagate, and produce delicious fruit every year. Unfortunately, Prickly Pears have glochids.

Glochids are those minuscule barbed spines that detach so easily when you brush against a Prickly Pear. They irritate for a long time, and when you try to remove all of the glochids from your skin there always seems to be one more elusive little devil left.

The larger glochids can be removed with tweezers, one by one, usually with the assistance of a magnifying glass. A quicker way is to use some kind of sticky tape. Some people like Scotch tape, but I think masking tape does a better job. Just take a piece and stick it to the area where you think you have been stuck by a glochid. Peel off the tape, and with luck the glochids will stick to the tape and come away. Repeat, if you have to, pulling the tape off in a different direction. This method works especially well with the almost microscopic glochids from the dreaded **Opuntia microdasys** or Bunny-Ear Prickly Pear.

I have also heard that application of rubber cement helps — let it dry and peel it off — but haven't tried it. And one man said he simply lets the glochids stay and work their own way out.

If you have glochids in an article of clothing you will have itching fits every time you put on your sweater, or whatever, until the garment is cleaned. Wash the item — by itself — and most of the glochids will go out in the rinse water. If you get glochids in leather gloves, throw the gloves away.

If you have ever moved an **Opuntia microdasys**, you may have noticed that the glochids detach and float on the wind until they land on you. To avoid this, spray the plant down with water before you move it, be as gentle as you can, and stay upwind. Personally, the only place I would like to move one of these dangerous plants is to the dump.

The Agave Snout Beetle

Many people call us in the fall about sick century plants. Often the symptoms are older, outer leaves wilted and drooping to the ground while the inner leaves are still in relatively good condition. Upon inspection you may notice that the heart of the Agave is rotted out. You can't help but notice the foul odor when the rotted tissue is exposed.

This may be caused by the larvae of the Agave snout beetle, **Scyphophorus** sp. The little larvae are white, usually curved, about an inch long, and three-eighths of an inch in circumference. They may live for a year or more in the trunk of the Agave, feeding on the plant's tissue and infecting the plant with the bacteria living in their mouths.

Usually by the time the infestation is noticed the plant is heading for the last round-up. The best thing to do is to take the plant to the dump so it will not infect any other Agaves you might have.

To protect your other Agaves, spread Diazinon granules around the base of your healthy century plants and work the granules into the ground about an inch or two. Do this at weekly intervals during the months of July and August, when the adult Agave snout beetles are most active. This will prevent the beetles from laying their eggs on your Agave. This treatment may also be a good precaution if you have an especially nice specimen you don't want to lose.

Pruning Perennial Wildflowers

One of our members called to ask why the **Zauchneria californica** he bought at the plant sale last year looks so ratty now.

The main disadvantage to long-flowering perennial wildflowers is that after the plant has stopped flowering you are left with a dried up inflorescence in the fall. If you prune these plants back to two to three inch stubs in the winter they will come back bushier than ever in the spring.

Other plants that may need pruning back now are: Desert Marigold — **Baileya multiradiata**; Beard Tongue — **Penstemon spp.**; and Mexican Evening Primrose — **Oenothera speciosa**.

This column is supposed to help Members with their desert gardens, so if you have any questions about your plants and how to care for them, I'd like to hear from you.

News & Notes

(Continued)

west of Blythe, California, when the winter rains came earlier than usual, was at least twelve miles wide. Kent Newland reports that the lake is now dry and from horizon to horizon the desert is a sea of purple Sand Verbena, **Abronia villosa**, with white primroses beginning to bud. Also, in the area, the stalks of the spectacular Desert Lily, **Hesperocallis undulata**, described in the December Bulletin, are up to three feet tall. If you can get away, this is an excellent opportunity to see a "desert spectacular".

Some additional welcome news is that the Garden has received an extremely generous anonymous gift of $2,000 for our Library, to be used for books and equipment. Librarian Elizabeth Fritz and her helpers are delighted, as is all the Garden staff. For one thing, the Library has needed a standard library card catalogue for several years, and the gift will make its purchase possible. Another welcome gift, especially for the Bulletin staff, is the donation of a Polaroid camera and equipment from Mrs. Frank Feffer. Those last-minute shots before the deadline are now possible.

The best news of the month, however, is the return to harness of Anne Amacker, our Business Manager, for half-days until she is fully recovered from her recent operation. Welcome back!

Coming to the Cactus Show?

Come as a Volunteer — help the Show as well as see it — enjoy it more — meet other Garden Members — even join us for a delicious lunch (prepared by Volunteers, of course).

Telephone the Garden now at 947-2800 and we'll match you with a congenial Volunteer job for a half-day or more, any time you can spare.

Show Volunteers know that they're the people who make the Cactus Show a success.

* * *

The Show's co-sponsor, the Phoenix Gazette, has printed publicity posters for the Show. If you can distribute any posters in your part of town, come and pick up some copies. Banks, branch libraries, drugstores, and nurseries are usually glad to display Show posters — can you think of other places?

MEET REG!

Friday, February 25th, something special happens — Reg Manning will be at the Garden from 2 to 4 p.m. to autograph his famous and funny books about Arizona and Arizona cactus.

Here's a rare chance to meet the man we know so well from his prize-winning editorial cartoons and his very popular books about our desert country.

Reg doesn't go in for public appearances, but he's a good friend of the Garden — witness his 30 years as an honored member of our Board of Directors — and he agreed to let us drag him away from his studio, for once, to autograph his books and meet his fellow members of the Garden.

Bring your copies of Reg's books on the 25th — you'll value them even more when they carry Reg's autograph. (The Garden Bookshop will have his books available, as always.)

BOOK REVIEW

THE PLANT BUYER'S HANDBOOK, Richard E. Nicholls. Published by Running Press, 1976. 142 pp., 25 illustrations, paperbound. $3.95 at the Garden's bookshop, $4.25 postpaid. (Available March 1st.)

An interesting and useful book for the person buying his first house plant, or the "old pro" looking for a new plant, this book emphasizes a point all too often forgotten when purchasing plants: choose a plant that's likely to grow and thrive under the conditions you can provide. The first section of the book tells how to evaluate your home environment from a plant's viewpoint and offers suggestions on improving the humidity, light and temperature. Part two discussed the requirements of 11 groups of plants, including cactus and succulents, and tells you what to look for when choosing a plant shop and a plant. The next section of the book is devoted to care of house plants from the basics of watering to propagation.

Part four will make this book useful long after you've become an expert on the preceding parts. It's a list of resources — horticultural and house plant societies, suppliers, other books to read, how to get plants into the country, and a list of 230 plants suitable for growing indoors, with a chart listing the light, temperature and humidity needs of each. Arizona indoor gardeners will find this book more helpful than most.

——SCK

On the Cover

Kalanchoe tomentosa is a very attractive leaf succulent, a member of the Crassulaceae. from central Madagascar. The entire plant, which can reach a height of eighteen inches, is covered with dense white felt. Margins of the tapered, fleshy leaves are marked with brown.

Correction

In printing, several lines of the December 1976 Bulletin article on **Peniocereus greggi** were garbled.

The first sentence of the second paragraph, second column, page 113, should read:

"The plants, because of their tuber size, might constitute a very considerable food source were they not relatively slow-growing and desirable as specimen plants."

Villa Exotique, Menton

(The fifth of W. H. Earle's reports on European gardens)

Dr. and Mrs. Willy Cullmann had visited the Desert Botanical Garden after attending the 1975 I.O.S. Congress in Santa Barbara. Now Jurg Rau and I were visiting the Cullmanns' home and unusual succulent garden at Menton, France, on the Cote d'Azur between Monte Carlo and Ventimiglia. While we had coffee on the terrace we could see the Mediterranean at our feet, Monaco to our right, and the Italian border to our left.

Dr. Cullmann has been a cactus hobbyist for many years. He co-authored "Kakteen unser Hobby" with Heinz Balzer in 1963, and wrote three later editions on his own. He has written several papers on his favorite genus, Haageocereus, and has had two cacti named for him, **Cullmannia**

viperina and **Thrixanthocereus cullmannianus**. He has been a moving force in the I.O.S., as well.

In 1972 the Cullmanns retired to Menton from Marktheidenfeld-am-Main near Wurzburg in West Germany, bringing with them Dr. Cullmann's fine plant collection, to make Villa Exotique a truly beautiful garden of exotic plants.

As can be seen in the accompanying photos, a portion of the property is occupied by two long cactus beds, 12 m long and 2 m wide, roofed with corrugated plastic to protect the plants during heavy rains. There are many other plants on the terraces and along the descending steps. In addition to specimens of Haageocereus, the gardens include excellent collections of Mammillaria, Astrophytum, Coryphantha, Trichocereus, the small Opuntias, Espostoa, Azureocereus, Echinopsis, Cleistocactus and many other genera.

I know that participants in the 1978 I.O.S. Congress, to be held at Monte Carlo, will be as delighted as I was to visit Dr. Cullmann's Villa Exotique.

A closer look at the upper (above) and lower (below) terraced cactus bed at Villa Exotique, only part of Dr. Cullmann's collection.

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GARDEN EVENTS

FEBRUARY

Tues.	**1st**	CACTOMANIACS—Meeting	**8:00 p.m.**
Wed.	**2nd**	CLASS—Cultivation of Desert Trees and Shrubs	**2:30 p.m.**
Thurs.	**3rd**	LECTURE—Arizona Flowering Trees	**3:00 p.m.**
Sat.	**5th**	FIELD TRIP—McDowell Mtn. Park	**8:30 a.m.-4:45 p.m.**
Wed.	**9th**	CLASS FIELD TRIP—Carefree area	**8:30 a.m.**
Thurs.	**10th**	LECTURE—Cactus Flowers	**3:00 p.m.**
Sun. thru Sun.	**20th 27th**	THIRTIETH ANNUAL CACTUS SHOW	**Daily 9:00-5:00 p.m.**

MARCH

Tues.	**1st**	CACTOMANIACS—Meeting	**8:00 p.m.**
Wed.	**9th**	CLASS—Introduction to Desert Plants	**2:30 p.m.**
Thurs.	**10th**	LECTURE—Valley of the Sun Desert Plants	**3:00 p.m.**
Sat.	**12th**	FIELD TRIP—Ajo	**8:30 a.m.-7:30 p.m.**
Wed.	**16th**	CLASS—Succulent Plants	**2:30 p.m.**
Thurs.	**17th**	LECTURE—Arizona Cacti in Flower	**3:00 p.m.**
Wed.	**23rd**	CLASS—Cultivation of Succulent Plants	**2:30 p.m.**
Thurs.	**24th**	LECTURE—Arizona's Plants—Mountains to Desert	**3:00 p.m.**
Sun.	**27th**	CAC & SS—Meeting	**2:00 p.m.**
Wed.	**30th**	CLASS—Desert Trees and Shrubs	**2:30 p.m.**
Thurs.	**31st**	LECTURE—Arizona Wildflowers	**3:00 p.m.**

Fees for field trips are $1.00 for Garden Members, $2.00 for non-members. Call the Garden to see if space is available before mailing fees. Limited space is now available only for the May field trip (See "News & Notes").

The Garden is open every day of the year from 9 a.m. to 5 p.m. Telephone: 947-2800 and 946-9942.

Visit the exciting

DESERT BOTANICAL GARDEN

more than a thousand different cacti
and other unusual plants
from the arid lands of the world
in a natural desert setting

in Papago Park, Phoenix, Arizona
access via 58th St. and Van Buren St.
or 64th St. and McDowell Rd.

a non-profit
institution
open every day
of the year
9 a.m. to 5 p.m.

admission is by
voluntary donation

2-77

Its Location

The Desert Botanical Garden is in the northeast corner of Phoenix' Papago Park, on 150 acres of natural desert. In the city of Phoenix and close to Scottsdale, it preserves a section of the desert in a growing metropolitan area.

Its Features

In the forty years of its existence, the Desert Botanical Garden has collected over half the different kinds of cacti in the world—some 1400 species are growing here out of doors or in the two large lath houses.

Along the paths, cacti from our Southwest, Mexico, Central and South America display the startlingly different ways that plants have adapted to life in the hot and nearly waterless deserts.

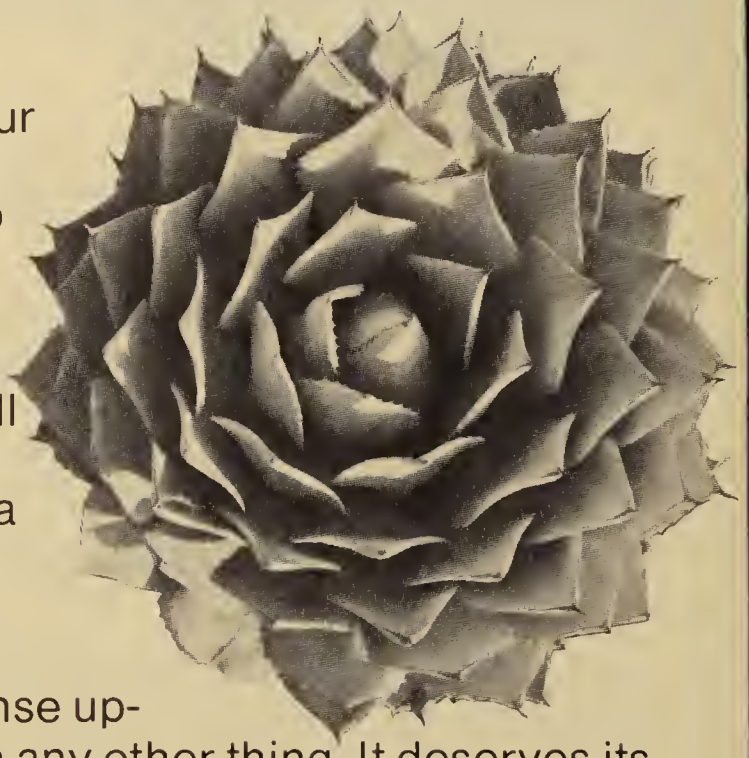
There are miniature cacti the size of a half-dollar as well as Arizona's giant Saguaro cactus, and the even more massive Mexican Cardon that can weigh as much as ten tons.

Organ Pipe, Octopus, Prickly Pear, Boxing Glove and Cow's Tongue are some of the names in the fascinating cactus family.

For protection from the sun, many cacti make their own shade—the small Golf Ball is almost invisible behind its barrier of white spines, the Old Man cactus has a head of long white hair. For protection from hungry desert animals, the Creeping Devil has strong dagger-sharp spines that penetrate the thickest leather, while the spineless Totem Pole cactus has a bitter alkaloid in its skin that no animal will sample for the second time.

Visitors during Arizona's long springtime get a bonus—the sight of cacti in flower. Large, delicate flowers, often sweet-scented, that are rivals of any orchid or rose or lily.

Other desert natives, spiny or spineless, have their own special features. You will see the succulent-leaved Century Plants—Agaves—that end their lives in a spectacular tower of blossoms, their first and their last.



The Ocotillo, or Coachwhip, from our own desert, is odd because it will drop and then renew all its leaves five or six times a year. But the oddest of all is the Boojum Tree from Baja California in Mexico. Called "Upside-down Tree" as well, it is shaped more like an immense up-ended parsnip than any other thing. It deserves its title "the most bizarre plant in North America."

A walk through the Garden introduces you to many other desert plants—African Aloes in great variety, African succulents that look like cacti, and Lithops, the "living stones" that seem to be gray-green pebbles, but are flowering plants.

Your self-guided tour—a very informative booklet is available—will be a delightful introduction to the strange and beautiful "world of little rain."

Membership Information

The Desert Botanical Garden receives no tax support of any kind. Its growth depends on contributions, the voluntary donations of visitors, and its membership in this country and abroad.

Membership categories:
ANNUAL MEMBERSHIP
Individual, $15.00; Family, $20.00; Sustaining, $50.00; Benefactor, $100.00; Elementary or High School, $3.00. LIFE membership, $500.00. PATRON membership, $1,000.00. CORPORATE MEMBERSHIPS are available in Benefactor, Life and Patron categories.

Garden Members receive the monthly Saguaroland Bulletin, reduced fees for classes and field trips, discounts, seed packets, and a number of other benefits.

MEMBERSHIP APPLICATION
Clip and mail with your check.
Desert Botanical Garden, Box 5415, Phoenix, Arizona 85010

Mr/Mrs/Miss _____

Address _____

City _____

State _____ Zip _____

Contributions and membership fees are deductible for tax purposes.

Its Importance

The Desert Botanical Garden is recognized internationally as the only botanical garden dedicated from its beginning to the study of the plant life of deserts and other arid lands.

Visitors from every state and many foreign countries total more than 120,000 annually.

The Garden is unique. Other institutions that wish to display desert plants must grow most of them in artificial conditions under glass. Here the majority of plants grow out of doors, naturally, and keep their true characteristics.

Since its founding in 1935, its threefold purpose has been to study, conserve and educate. The Garden is engaged in a worldwide program of assistance and exchange with other botanical institutions, scholars and scientists. It is the center for the definitive study of the Agaves. Rare and threatened species of desert plants are propagated here, as well as plants with horticultural potential.

As a place where members of the public can see the many facets of desert plant life from both hemispheres, it is unequalled.

Special Events

"An Introduction to the Desert and its Plants"—a series of classes held in fall, winter and spring.

Illustrated Lectures—on desert plants and animals, held on Thursday afternoons at 3:00 p.m., except during summer. Open to the public without charge.

Monthly Field Trips—to the desert, mesas and mountains. Open to the public when space available. Reservations necessary.

The Annual Cactus Show—a major event for gardeners and other plant enthusiasts since 1945. Awards for exhibits of cacti, leaf succulents, planters, arrangements, photography and art. Held during the last part of February for eight days.

Plant Sale—rare, unusual and just-introduced plants for desert gardens. Held in late March or early April.

The Desert Botanical Garden offers outstanding exhibits of cacti, leaf succulents, and other plants from the deserts of the world.

Open every day of the year from 9 a.m. to 5 p.m. Admission is by voluntary donation.

Wheelchairs are available without charge.

Located in Papago Park, Phoenix, Arizona, U.S.A.
Mailing address: Box 5415, Phoenix Arizona, 85010
Telephone: (612) 947-2800

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SAGUAROLAND BULLETIN

MARCH, 1977

SAGUAROLAND BULLETIN

Vol. XXXI MARCH, 1977 No. 3

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entered by Robert Moulis.

Photographs in this issue by
Fred Baselt, Rodney Engard and Bill Kepner

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Corporate Memberships available in Benefactor and Patron categories.

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ARIZONA CACTUS AND NATIVE FLORA SOCIETY

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Emeritus: W. H. Earle, Director; Angela Bool, Reg Manning, Executive Board; Eleanor B. Sloan, Advisory Board.

REPORT OF THE 30th ANNUAL CACTUS SHOW

Every year at this time we say that this one was the best show ever. Judging from the attendance figures and the income generated by this year's show, we think we can reasonably say it again. There were over 25,000 visitors. The expanded plant sale took in four times the amount of any previous year. Yes, we can say it was the best show ever.

The show this year demonstrated several things. Namely, the importance of publicity, and Carolyn Hoppin certainly showed she knows how to get that for us. Also, the necessity of expanding our parking capacity for next year's show. Our current parking lots are nowhere big enough. Our special thanks should go to the Phoenix Gazette, the show co-sponsor, and to the television and radio stations and other area newspapers who covered the show.

I wish to express my personal thanks to all the show volunteers, but especially those who headed individual Cactus Show committees: Chuck Merbs, for a super-successful plant sale; Thelma McDougall, for organizing the best food service in the country; Dorothy O'Rourke, for organizing and upgrading our photography section; Isabelle Holt, for arranging many details of the art section; Henry Triesler, for procuring the distinctive awards. The show committee met regularly from early November on, and kept contributing both mental and physical labor right through show week. Other members of the committee were Genevieve Oppen, Fran Tolleson, Bob Moulis, Margaret Caldwell, Mary Getz, Marjorie Jackman, Lewis Bremer, Lillian Diven, Lela Turner, Berdie Stevens, Mildred May and Carolyn Hoppin.

Special thanks to Reg Manning, Board Member Emeritus, for generously holding an "autograph session" for the benefit of the Garden.

A special word about Lillian Diven who has had an important role in the development and decisions regarding the Cactus Show for many years now. Lillian is responsible for getting out all the printed matter which emanates from the Garden during the year. She shifts her five-to-seven-day-a-week volunteer job into high gear during show preparation to eliminate the illiteracies of us all.

Other friends of the Garden volunteered for a great variety of jobs that ranged from preparing food, and registering show entries, to counting attendance and checking the last visitors out at closing time. They were: Khrybel Amberg, George Andersen, Susan Baptie, Lelia Barber, Fred Baselt (our "official show photographer"), Tom Birt, Lew and Barcia Bremer, Kathy Corbett, Christina Dezelsky, Warner Dodd, Zoe Dodd, Mr. and Mrs. W. H. Earle, Sister M. A. L. Eifert, and Genevieve Evans who, with Angeline Nicosia, sent out newspaper stories on all of the out-of-city winners.

Alice Feffer, Florence Fish, Muriel Freeman, Helen Friedrichs, Elizabeth Fritz, Marie Gentry, Peg Gill, John Graham, (he took a day off from work to help), Ruth Greenhouse, Helen Griesenbeck, Mary Hale, Phil and Frank Hennessey, Ki Hermann, Wendy Hodgson, Mildred Hunt, Don Hutton, and Margaret Jenkins.
Margaret Jenkins.

Margaret Kaduck, Camille Kimse, Dorothy Kravens, Alice Lemmon, Miona Mackey, Duane Martin, Ella Martin, Marge and Harry Mason, Lillian Mieg, Inez Moffit, Orrie Mulholland, Art Murray, Martha Passwater, Alice and Wendell Phillips, and Christa Roberts.

Virginia Sanger, Mavis and John Sauwen, Betty Schrieber, Frances Shellington, Virginia Spangler, Esther Somerville, Vera and Fred Starbuck, Peggy Stryke, June and Earl Sundeen, Dave Sundstrom, Ruth Thurber, Ruby and Bill Tucker, Rose Ann Wallace, John Walter, Joy Lee Weber (judge, cook, super signmaker!), Jean Wiehe, and Mildred Yenchius. To all, muchissimas gracias!

Reg Manning autographs "What Kinda Cactus Izzat?" for Thelma McDougall.

The generosity of Members who contributed plants, pots, cuttings, bags and boxes for the plant sale was noteworthy. Many thanks to Bill and Sue Ahearn, Khrybel Amberg, Herman Bartholomay, Nola Belford, Kay and Floyd Betts, Ethel Carey, Alice Feffer, Mrs. Henry Fine, Isabelle and Art Holt, Mrs. Megarvin, Lillian Mieg, Bob Moulis, John Rhuart, Henrietta Schaeffer, Noel Stafford, Lela Turner, Mr. and Mrs. Wesp, Mildred Yenchius, and Mrs. Zim, as well as many of the above-mentioned volunteers.

Another special thanks from me to the entire Garden staff, who, aided by able

The Plant Sale—our Student Entrance patio made a great site for it.

volunteers, worked nineteenth-century factory labor hours (though without even Sundays off!) to produce the most successful show ever.

Planning for the 1978 Cactus Show started almost before the 1977 show closed. The Cactomaniacs meeting on March 8th was given over to an analysis of what went right and what went wrong this year. Over seventy Cactus Show volunteers and exhibitors attended, and those who could not attend sent in suggestions. A great deal of useful and otherwise unobtainable information was obtained for next year's show committee to work with.

The Board of Directors of the Society and Garden, in recognition of the valuable service rendered to the Garden and the community by our volunteers, held the First Annual Volunteer and Award Dinner in the Webster Auditorium on the evening of March 15th. A special award was given to Lela Turner for her long years of service to the Garden.

Lela has been a Member since 1937, long before the Garden opened, and has been steadfast in her devotion to the Garden for forty years. The staff is constantly amazed at her energy — she never sits down — and the amount of work she does. A silver and ironwood brooch, with the Garden's Agave featured, was especially designed as an appropriate award for this distinguished lady's service.

Our two former librarians were awarded Life Memberships in the Garden for their many hours of donated expertise. Eleanor Radke, who was our librarian from 1968 through 1971, was the prime mover and organizer in cataloguing the vast Richter book collection and integrating it with the Garden's own collection. Hers was a difficult, intricate job, and the Garden was most fortunate to have the help of this skilled volunteer.

Peg Gill (we rarely called her Margaret) succeeded Eleanor Radke as librarian, and retired from that position in January. Peg brought to the job not only her experience as a botanical librarian with the USDA, but also a "personal acquaintance" with succulent plants acquired in East Africa. She used to drive to the Garden from Apache Junction twice a week to work with her co-volunteers and direct their activities. We miss Peg, but now she has time to travel.

Letters of appreciation were presented to two volunteers who can no longer participate in the volunteer program because of ill health. They are Dorothy Reiff and Paul Neumann. Dorothy worked in the Bookshop, as dependable as the Arizona sun, and Paul, with his late wife, Ruby, helped get the Saguaroland Bulletin out for fifteen years.

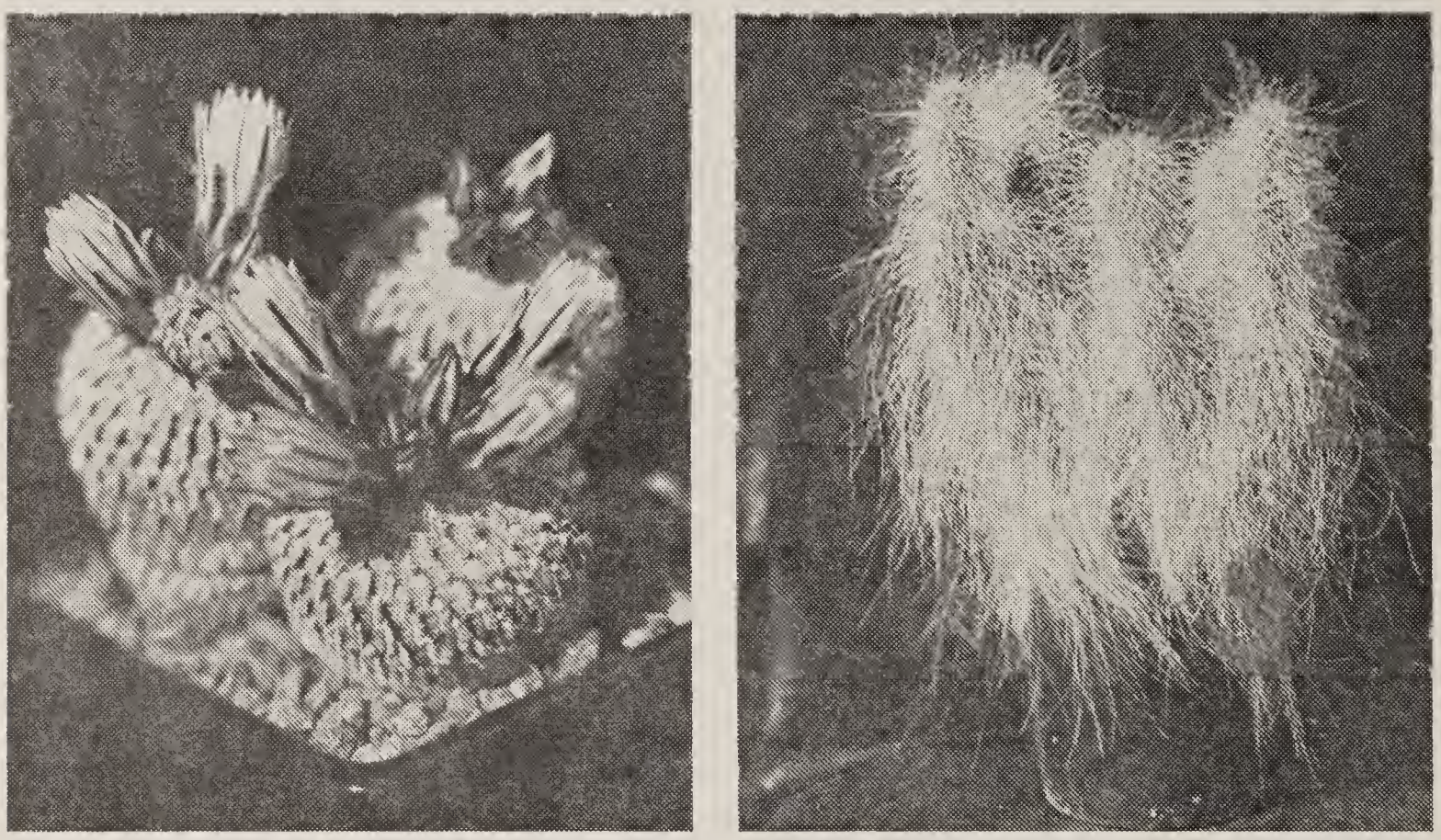
Immediately after the Cactus Show, the staff began setting up a major exhibit in the Phoenix Civic Plaza for the "Living with Plants" exposition. Four hundred square feet of display space and an additional hundred square feet of promotional space has been donated for Garden use by the show management. Volunteers are needed in both areas to provide information to the public about our Garden. The show opens March 17 and runs through the 20th. A limited number of reduced-admission tickets are available here at the Garden for volunteers who wish only to attend the show. It should be quite an opportunity for us to acquaint an estimated 40,000 people with the Garden.

Following that show, the Garden's own 2nd Annual Unusual Plant Sale is scheduled for April 16th, with a members-only preview sale on Friday, April 15th, from 4:00 p.m. until sundown. Bring your membership card.

Emphasis will be on new trees, shrubs and perennial wildflowers, but we also expect to have a fine selection of cactus and other succulents from the best growers. In addition,

we have recently made a special purchase of a superb private collection of cactus and succulents, part of which will be made available to our Members and the public.

Then, of course, in May there is the biennial convention of the Cactus and Succulent Society of America, in Tucson. The Garden will be involved. We may be calling on some knowledgeable Garden Members to act as guides in leading convention-goers on tours of the Garden.



Fran Tolleson's *Pelecyphora pseudopectinata* (left), Best Cactus in Show. Right, Emma Oscarson's 1st prize *Opuntia erinacea* var. *ursina*.

THIRTIETH ANNUAL CACTUS SHOW AWARD WINNERS

SWEEPSTAKES AWARDS

PHOENIX GAZETTE TROPHY (for most points awarded in Show): Fran M. Tolleson, 9641 N. 4th Ave., Phoenix
CACTUS: Robert Moulis, 13431 N. 33rd Pl., Phoenix
OTHER SUCCULENTS: James A. Robbins, Sierra Vista
PLANTERS: Fran M. Tolleson

TROPHY AWARDS

CACTUS: Fran M. Tolleson
AZTEKIUM (Div. 1): Robert Moulis
ECHINOMASTUS (Div. 5): Sarah Ives, Superior
MAMMILLARIA: Genevieve Oppen, 2633 N. Evergreen St., Phoenix
NOTOCACTUS: Dan S. Birt, 1517 N. Beverly, Tucson
COLLECTION OF CACTUS: Robert Moulis

OTHER SUCCULENTS: Genevieve Oppen
AGAVE: Shannath Merbs, 8408 S. Newberry Ln., Tempe
COLLECTION OF OTHER SUCCULENTS: James A. Robbins
SEEDLINGS: Sarah Ives
PLANTER: Alice Feffer, 7349 Clearwater Pkwy., Scottsdale
DISH GARDEN: Martha Passwater, 7014 N. 15th St., Phoenix
LARGE ARRANGEMENT: Joan Gossman, 5247 N. 8th Pl., Phoenix
SMALL ARRANGEMENT: Dot Wakefield, Apache Junction
PHOTO PRINT: Robert E. Pribbenow, 3342 E. Pierce St., Phoenix
TRANSPARENCY: John H. Walter, 10568 Oakmont Dr., Sun City
ART: Zoraida Twitty, 520 W. Lamar Rd., Phoenix.

RIBBON AWARD WINNERS

SECTION I, CACTI. CLASS A, INDIVIDUAL SPECIMENS.

1. ARIOCARPUS, AZTEKIUM, OBREGONIA. 1st, Robert Moulis. 2nd, 3rd and 4th, Fran Tolleson. 4th, Lewis Steichman.
2. ASTROPHYTUM. 1st, Margaret Kaduck. 2nd and 4th, John Graham. 3rd, R. Moulis.

3-a. COLUMNAR CEREUS, NORTH AMERICA. 1st, L. Steichman. 2nd, Henry Triesler. 3rd, J. Graham.

3-b. COLUMNAR CEREUS, SOUTH AMERICA. 1st, M. Kaduck. 2nd and 3rd, Genevieve Oppen.

4. COPIAPOA, PARODIA, MATUCANA. 1st, R. Moulis. 2nd and 3rd, F. Tolleson.
5. CORYPHANTHA, ECHINOMASTUS, ESCOBARIA, NEOLLOYDIA. 1st, Sarah Ives. 2nd and 4th, F. Tolleson. 3rd and 4th, R. Moulis. 4th, L. Bremer.
6. ECHINOCACTUS, FEROCACTUS, HAMATOCACTUS. 1st and 3rd, H. Triesler. 2nd, L. Bremer. 4th, Tom Birt. 4th, J. Graham.
7. ECHINOCEREUS. 1st, Dorothy Kravens. 2nd, James Robbins. 3rd, Joseph Kaduck. 4th, L. Bremer.
8. ECHINOPSIS, LOBIVIA. 1st and 3rd, F. Tolleson. 2nd, H. Triesler. 4th, J. Graham.
9. EPITHELANTHA. 1st and 4th, F. Tolleson. 2nd, Martha Passwater. 3rd, J. Graham.
10. GYMNOCALYCIUM, REBUTIA. 1st, G. Oppen. 2nd, Charles F. Merbs. 3rd, J. Graham. 4th, Barbara Markley. 4th, John Robbins.

11-a. MAMMILLARIA (pots up to 4″). 1st, R. Moulis. 2nd, F. Tolleson. 3rd, G. Oppen. 4th Dan S. Birt.

11-b. MAMMILLARIA (pots 4″ to 10″) 1st and 2nd, G. Oppen. 3rd, R. Moulis. 4th, Noreen Frank, Margaret Caldwell, J. Kaduck, John Gaston, James Robbins.

11-c. MAMMILLARIA (pots over 10″). 1st, R. Moulis. 2nd, L. Bremer. 3rd, Emma Oscarson.

12. MELOCACTUS. 1st, H. Triesler. 2nd, F. Tolleson. 3rd and 4th, G. Oppen. 4th, L. Steichman.
13. NEOPORTERIA. 1st, R. Moulis. 2nd, C. Merbs. 3rd, L. Steichman. 4th, E. Oscarson.
14. NOTOCACTUS. 1st, D. Birt. 2nd, E. Oscarson. 3rd, M. Passwater. 4th, F. Tolleson, J. Graham.
15. OPUNTIA, PTEROCACTUS, TEPHROCACTUS, GRUSONIA. 1st, E. Oscarson. 2nd, G. Oppen. 3rd, M. Caldwell. 4th, Dottie Battiest.
16. PEDIOCACTUS, TOUMEYA, UTAHIA, SCLEROCACTUS. 1st, L. Bremer. 2nd, Kathy Corbett.
17. PELECYPHORA, SOLISIA, TURBINICARPUS. 1st, F. Tolleson. 2nd, G. Oppen. 3rd, J. Graham. 4th, M. Passwater.

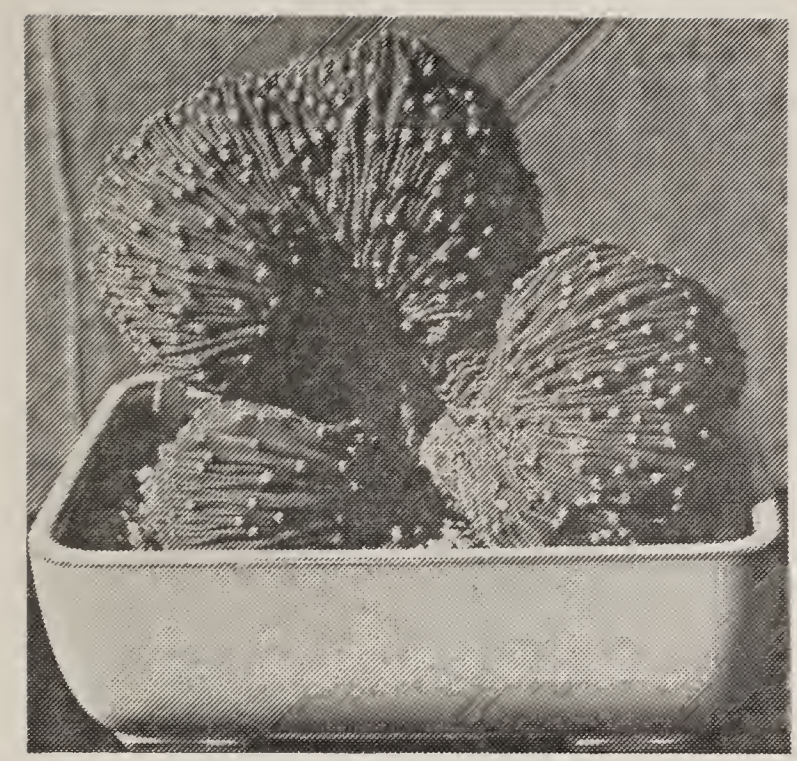
18. STENOCACTUS. 1st, G. Oppen. 2nd, C. Merbs. 3rd, M. Passwater.
19. THELOCACTUS. 1st, R. Moulis. 2nd, F. Tolleson. 3rd, T. Birt. 4th, E. Oscarson.
20. ANY OTHER GENUS. 1st, F. Tolleson. 2nd, J. Gaston. 3rd, G. Oppen. 4th, F. Tolleson, Alice Feffer, J. Graham.
21. CLEISTOCACTUS. 1st and 3rd, G. Oppen. 2nd, L. Steichman. 4th, D. Birt.
22. ESPOSTOA. 1st and 2nd, F. Tolleson. 3rd, Mrs. R. Enz. 4th Charles Fellers.
23. OREOCEREUS. 1st, James Engel. 2nd, G. Oppen. 3rd, J. Graham. 4th, L. Steichman, Warner Dodd.
24. CHAMAECEREUS. 1st, Mary Emery. 2nd, D. Battiest.
25. CEPHALOCEREUS. 1st, E. Oscarson. 2nd and 3rd, H. Triesler. 4th, F. Tolleson.

CLASS B, CRESTED OR MONSTROSE.
1. OWN ROOT. 1st, James Robbins. 2nd and 4th, R. Moulis. 3rd, F. Tolleson.
2. GRAFTED. 1st and 2nd, R. Moulis.

CLASS C, GRAFTED.
1st and 2nd, R. Moulis. 3rd, J. Skirvin.

CLASS D, COLLECTIONS.
1st, R. Moulis. 2nd, J. Skirvin. 3rd, G. Oppen. 4th, H. Bartholomay.

SECTION II, SUCCULENTS OTHER THAN CACTI. CLASS A, INDIVIDUAL SPECIMENS.
1. ADROMISCHUS. 1st, M. Passwater. 2nd, F. Tolleson. 3rd, James Robbins.
2. AEONIUM. 1st and 2nd, F. Tolleson. 3rd, Bonnie Rodriguez. 4th, M. Passwater, James Robbins.
3. AGAVE. 1st, Shannath Merbs. 2nd and 3rd, F. Tolleson. 4th, Orrie Mulholland, James Robbins.
4. ALOE. 1st, Joan Skirvin. 2nd and 4th, R. Moulis. 3rd, E. Oscarson. 4th, George Andersen, H. Triesler, James Robbins.
5. ANACAMPSEROS. 1st, 2nd and 3rd, James Robbins.
6. ASCLEPIADS, STAPELIAS, ETC. 1st, R. Moulis. 2nd, G. Oppen. 3rd, T. Birt. 4th, H. Triesler.
7. CONOPHYTUM. 1st and 3rd, James Robbins. 2nd, Kathy McCombs.
8. COTYLEDON. 1st and 2nd, Sarah Ives. 3rd, James Robbins. 4th, L. Steichman.
9. CRASSULA. 1st and 4th, M. Passwater. 2nd, F. Tolleson. 3rd, James Robbins.
10. ECHEVERIA, DUDLEYA, GRAPTOPETALUM, SEMPERVIVUM. 1st, 2nd and 4th, James Robbins. 3rd, M. Kaduck. 4th and 4th, F. Tolleson. 4th, K. McCombs.
11. EUPHORBIA. 1st, G. Oppen. 2nd and 3rd, F. Tolleson. 4th, James Robbins. 4th and 4th, H. Triesler.
12. HAWORTHIA, GASTERIA, ASTROLOBA. 1st, F. Tolleson. 2nd and 3rd, James Robbins. 4th, Herman Bartholomay, M. Passwater, J. Skirvin.
13. KALANCHOE. 1st and 3rd, F. Tolleson. 2nd, Judy Burggraaf.
14. LITHOPS. 1st, John Robbins. 2nd, James Robbins. 3rd, M. Passwater.
15. PLEIOSPILOS. 1st and 3rd, James Robbins. 2nd, F. Tolleson.
16. SEDUM, PACHYPHYTUMS. 1st, D. Birt. 2nd and 4th, James Robbins. 3rd, L. Steichman.
17. SENECIO, KLEINIA, STYLOPHYLLUM. 1st, F. Tolleson. 2nd, G. Oppen. 3rd, James Robbins.
18. OTHER MESEMBRYANTHEMACEAE. 1st, K. McCombs. 2nd and 3rd, James Robbins.



Left, *Aeonium pseudotabulaeforme*, 1st prize for Fran Tolleson. Right, Henry Triesler's fine crested Echinopsis.

19. ANY OTHER GENUS. 1st and 3rd, F. Tolleson. 2nd, H. Bartholomay. 4th, James Robbins.
20. PACHYPODIUM. 1st and 3rd, H. Triesler. 2nd, F. Tolleson. 4th, G. Oppen.
21. FAUCARIA. 1st, M. Passwater, 2nd and 3rd, James Robbins.
22. TITANOPSIS. 1st and 2nd, F. Tolleson. 3rd, L. Steichman.
23. ALIONOPSIS. 1st and 3rd, James Robbins. 2nd, John Robbins.
24. GIBBAEUM. 1st, 2nd and 3rd, James Robbins.
25. CHERIDOPSIS. 1st and 2nd, James Robbins. 3rd, John Robbins.
26. GLOTTIPHYLLUM. 1st and 2nd, James Robbins. 3rd, Kathy McCombs.
27. MITROPHYLLUM. (No awards)
28. MONILARIA. (No awards)
29. OPHTHALMOPHYLLUM. 1st and 2nd, James Robbins.
30. RUSCHIA. (No awards)

CLASS B, COLLECTIONS. 1st, James Robbins. 2nd, H. Triesler. 3rd, F. Tolleson.

SECTION III, SEEDLINGS.

1. CACTI. 1st, Sarah Ives. 2nd, F. Tolleson. 3rd and 4th, C. Merbs.
2. SUCCULENTS OTHER THAN CACTI. 1st, 4th and 4th, Kathy McCombs. 2nd, Sarah Ives. 3rd, C. Merbs. 4th, James Robbins.
3. DESERT TREES AND SHRUBS. 1st, L. Steichman.

SECTION IV, DESERT TREES AND SHRUBS

CLASS A, TREES AND SHRUBS. 1st, T. Birt. 2nd, H. Triesler. 3rd, A. Feffer. 4th, E. Oscarson.

CLASS B, DESERT BONSAI. 1st and 4th, F. Tolleson. 2nd, H. Triesler. 3rd, James Robbins.

CLASS C, CAUDICIFORMS. 1st and 4th, H. Triesler. 2nd, James Robbins. 3rd and 4th, F. Tolleson.

SECTION V, PLANTERS.
CLASS A, DISH GARDENS.

1. CACTI. 1st, Stan Jones. 2nd, Jacqueline L. Evans. 3rd, Fran Tolleson. 4th, Lillian Lugibihl.
2. OTHER SUCCULENTS. 1st, Martha Passwater. 2nd, Fran Tolleson. 3rd, Genevieve Oppen. 4th, Emma Oscarson.
3. CACTI & SUCCULENTS. 1st, Emma Oscarson. 2nd, Orrie Mulholland. 3rd, Mary Emery. 4th, M. Emery.

CLASS B, HANGING PLANTERS. 1st, Martha Passwater. 2nd, Fran Tolleson. 3rd, F. Tolleson.

CLASS C, PATIO PLANTERS. 1st, Alice Feffer. 2nd, Stan Jones. 3rd, Sarah Scott. 4th, Herman Bartholomay.

SECTION VI, ARRANGEMENTS.
CLASS A, DRIED DESERT MATERIAL (with accessory). 1st, Emma Oscarson. 2nd, Lillian Lugibihl. 3rd, Joan Gossman.

CLASS B, DRIED DESERT MATERIAL (with wood). 1st, J. Gossman. 2nd, Mrs. Robert Peddle. 3rd, E. Oscarson.

CLASS C, CACTI (coffee table). 1st, Lela Turner.

CLASS D, SUCCULENTS OTHER THAN CACTI (entry hall). 1st, L. Turner. 2nd, Linda Sabo.

CLASS E, CACTI & OTHER SUCCULENTS (water interest). 1st, L. Turner.

CLASS F, ALL-GREEN ARRANGEMENTS. 1st, E. Oscarson. 3rd, L. Turner.

CLASS G, BUTTON ARRANGEMENTS.

1. CACTI & OTHER SUCCULENTS. 1st, Joan Gossman. 2nd, Bonnie Rodriguez.
2. DRIED DESERT MATERIAL. 1st, J. Gossman. 2nd, B. Rodriguez.

CLASS H, MINIATURE, UNDER 5" HIGH.

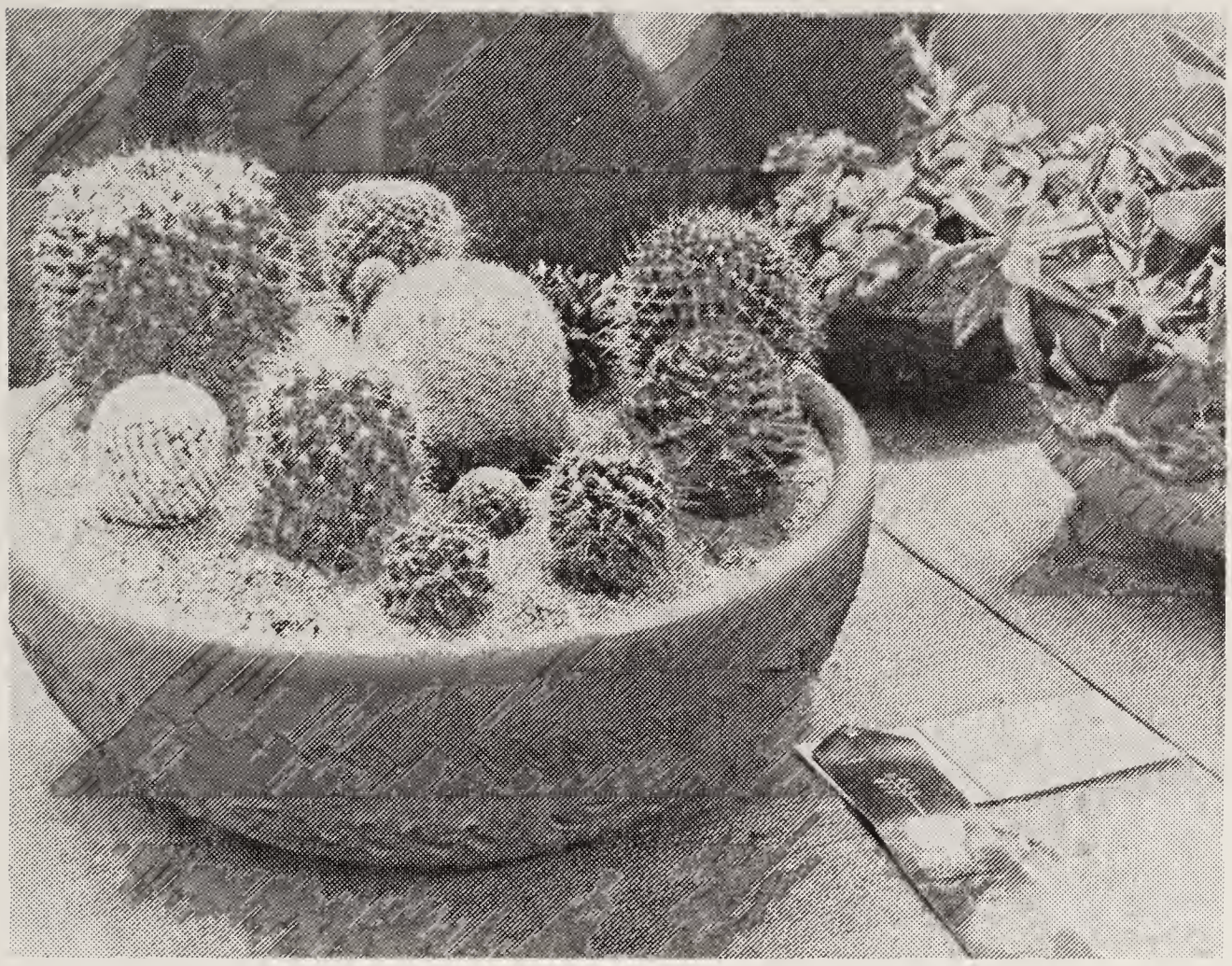
1. (No awards)
2. DRIED DESERT MATERIAL. 1st, J. Gossman. 2nd, Kay Frank.

CLASS J, CORSAGES.

1. (No awards)
2. DRIED DESERT MATERIAL. 1st, Dot Wakefield.

SECTION VII, PHOTOGRAPHY.
CLASS A, BLACK & WHITE PRINTS. Landscapes: 1st and 4th, Duane A. Martin. 2nd, Richard Dale. 3rd, Will Turnage. Wildlife: 1st, Pieter Burggraaf. 2nd and 3rd, John H. Walter. Plants: 1st, Mike Hennessey. 2nd and 3rd, Pieter Burggraaf.

CLASS B, COLOR PRINTS. Landscapes: 1st, Bud Schragl. 2nd, Ken Kingsley. 3rd, Will Turnage. 4th, Walter J. Groll, Sr. Wildlife: 1st, Margaret Kurzius. 2nd, Joe DiStefano.



Stan Jones was awarded a blue ribbon for this dish garden.

Plants: 1st, Robert E. Pribbenow. 2nd, W. M. Salminen. 3rd, Olivine Cochrane. 4th, Nickala McNichols, Joe Bormanis, Mike Hennessey.

CLASS C, TRANSPARENCIES. Landscape: 1st, M. Genevieve Evans, 2nd, Margaret Kurzius. 3rd, Dorothy O'Rourke. 4th, Walter J. Groll, Sr., James B. Cochrane. Wildlife: 1st and 2nd, John H. Walter. 3rd and 4th, Olivine Cochrane. 4th, Walter J. Groll, Sr., Richard Dale, Frances Shellington.

SECTION VIII, ARTS.

CLASS A, OILS. 1st, Zoraida Twitty. 2nd, Del Decil. 3rd, Aileen Masters. 4th, Eileen Alford.

CLASS B, WATERCOLORS. 1st, Del Decil. 2nd, Isabelle Holt. 3rd, Zoraida Twitty. 4th, Don Hutton. 4th, Al DeBrito.

CLASS C, GRAPHICS. 1st, Barbara C. Hovatter. 4th, Margaret Kurzius. 4th, Margaret Sloan.

CLASS D, MIXED MEDIA. (No awards)

CLASS E, BOTANICAL ILLUSTRATION. 1st and 2nd, Jean Price Norman. 3rd, Christina Dezelsky.

SECTION IX, EDUCATIONAL EXHIBITS. 1st, Gerald Yates. 2nd, H. Bartholomay. 3rd, James Robbins.

DESERT BOTANICAL GARDEN

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GARDEN EVENTS

MARCH

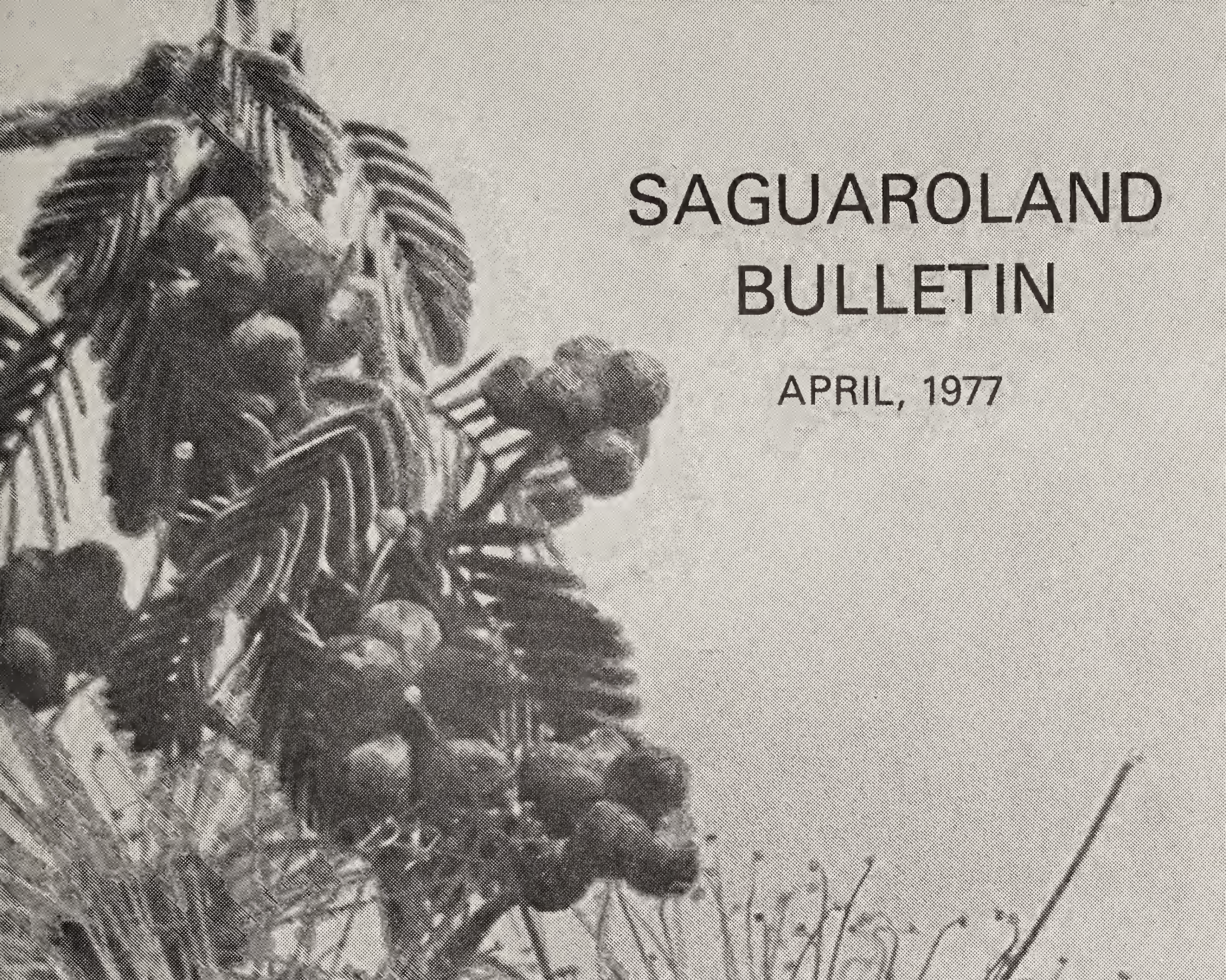
Tues.	**8th**	CACTOMANIACS—Meeting	**8:00 p.m.**
Wed.	**9th**	CLASS—Introduction to Desert Plants	**2:30 p.m.**
Thurs.	**10th**	LECTURE—Valley of the Sun Desert Plants	**3:00 p.m.**
Sat.	**12th**	FIELD TRIP—Ajo	**8:30 a.m.-7:30 p.m.**
Wed.	**16th**	CLASS—Succulent Plants	**2:30 p.m.**
Thurs.	**17th**	LECTURE—Arizona Cacti in Flower	**3:00 p.m.**
Wed.	**23rd**	CLASS—Cultivation of Succulent Plants	**2:30 p.m.**
Thurs.	**24th**	LECTURE—Arizona's Plants—Mountains to Desert	**3:00 p.m.**
Sun.	**27th**	CAC & SS—Meeting	**2:00 p.m.**
Wed.	**30th**	CLASS—Desert Trees and Shrubs	**2:30 p.m.**
Thurs.	**31st**	LECTURE—Arizona Wildflowers	**3:00 p.m.**

APRIL

Tues.	**5th**	CACTOMANIACS—Meeting	**8:00 p.m.**
Wed.	**6th**	CLASS—Cultivation of Desert Trees and Shrubs	**2:30 p.m.**
Thurs.	**7th**	LECTURE—Mexican Cacti	**3:00 p.m.**
Sat.	**9th**	FIELD TRIP—Hidden Canyon	**8:30 a.m.-4:45 p.m.**
Wed.	**13th**	CLASS FIELD TRIP—Usery Mountain Park	**8:30 a.m.**
Thurs.	**14th**	LECTURE—Arizona Flowering Trees	**3:00 p.m.**
Sat.	**16th**	SALE OF UNUSUAL PLANTS for Desert Gardens	**9:00-5:00 p.m.**
Thurs.	**21st**	LECTURE—Cactus Flowers	**3:00 p.m.**
Sun.	**24th**	CAC & SS—Meeting	**2:00 p.m.**
Thurs.	**28th**	LECTURE—Arizona Cacti in Flower	**3:00 p.m.**

Fees for field trips are $1.00 for Garden Members, $2.00 for non-members. Call the Garden to see if space is available before mailing fees. Limited space is now available only for the May field trip.

The Garden is open every day of the year from 9 a.m. to 5 p.m. Telephone: 947-2800 and 946-9942.



SAGUAROLAND BULLETIN

APRIL, 1977

SAGUAROLAND BULLETIN

Vol. XXXI APRIL, 1977 No. 4

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Cover: Fairy Duster, *Calliandra eriophylla.*
Photo W. H. Earle

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DESERT BOTANICAL GARDEN

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News & Notes

The Garden recently participated in the "Living with Plants" horticultural show at the Phoenix Civic Plaza. Assistant Professor Bill Larson of the Architecture Department at Arizona State University had offered his graduate students in landscape architecture the optional project of designing our Garden's display for the show, and two of the students responded with excellent designs. Ultimately, the design by Phil Schroeder was selected and constructed by the pooled talents of our staff and volunteers. The resulting display, pictured elsewhere in the Bulletin, combined "indoors" and "outdoors" plantings of exclusively desert plants, and impressed the show judges sufficiently for them to award the Garden the premier prize for the entire show.

Credit is due to those who built the entire display in three long days, lent us plants, and worked in our public information area: Russ Haughey, Sherry Krummen, Alan Jones, Mark Holman, Bill Kepner and Barry Feldman, who constructed and arranged the exhibit; Fran Tolleson, Genevieve Oppen and Henry Triesler, whose plants were in full bloom; Carolyn Hoppin, who worked with the show's sponsors from the beginning; Anne Amacker, Jan Moats, Tom Caldwell, Joy Lee Weber, Christina Dezelsky and Lisa Dezelsky, Orrie Mulholland, Lillian Diven, Joyce Baldwin, Mary Hale, our designer Phil Schroeder, and our Board President Mildred May, who all helped bring the Garden to the attention of new people. Mr. Paul Voegler of Goldwaters' generously lent us the furniture for the interior of the display and tables for our information booth.

If you missed the show and would like to see the display, it is our intention to use it at next fall's State Fair.

* * *

This month the Garden holds its 2nd Annual Sale of Unusual Plants for Desert Gardens. This year's sale will include a number of spectacular and interesting plants, some of them in answer to requests from gardeners attending last year's sale. The Members-only preview sale will begin on Friday, April 15, at 4:00 p.m. and end at sundown. Be sure to bring your membership card with you in order to be admitted to the sales area. The sale opens to the public at 9:00 a.m. April 16th and runs until 5:00 p.m. the same day.

(continued on page 44)

AGAVE ARIZONICA, A RARE SPECIES

by Howard Scott Gentry

Agave arizonica is one of the rare plants of North America. It is known only from the New River Mountains in central Arizona, where 12 to 14 individual sites, each with one to several plants, occur over a radius of two to three miles. This area overlaps the boundary of Maricopa and Yavapai Counties at elevations between 3000 and 5000 feet. The plants are small, scattered, and hard to find on the rough rocky grassland liberally sprinkled with the xerophytic Arizona chaparral of juniper, scrub oak, and many other shrubs, **Figure 1**. We owe our knowledge of the distribution of this rare plant to the horticulturist, John Henry Weber, who, with his hunting companions, made repeated forays during the 1960's over the New River Mountains looking for the plants. Weber brought young plants to the Desert Botanical Garden, where one flowered in June 1968, **Figure 3**. It was botanically named and described by Gentry and Weber (Cac. & Succ. J. N. Amer. 62: 222-228, 1970). Subsequently, live specimens were distributed to other institutions, including the Huntington Botanical Garden, San Marino, California, and the University of Arizona Southwestern Arboretum, Superior, Arizona.

Agave arizonica forms compact green rosettes 10 - 14 inches tall. They are readily recognizable by a combination of characters: (1) The thin corneous leaf margin along the upper edges of the leaf, brown or reddish at first but becoming white, and on dried herbarium specimens lined with a thin dark line; (2) small fragile teeth, 1-2 mm long, easily broken, **Figure 4**; (3) a narrow racemose panicle of small flowers in small clusters, **Figure 3**; (4) short broad flowers with strictly erect yellow tepals, **Figure 2**. Three or four notable forms of this species have been observed. One form is a small-leaved (6-8 inches) plant with close-set triangular nearly straight teeth. Another is a broad-leaved form with broad white margin set with low deflected teeth, **Figure 4**. A third is a narrower longer-leaved form with the teeth very sharply deflected in long (3-4 mm) acicular cusps. Such variability in teeth and leaf form has been noted in nearly all free-seeding agave species. With observation the agave student soon recognizes these minor variations as genetic combinations almost universal among outbreeding organisms.

In morphology of leaf **A. arizonica** appears related to **A. deserti** or **A. chrysantha**. The former grows not far away on the Harquahala Mountains and **A. chrysantha** is common in the New River Mountains. **A. arizonica** at some time in the geologic past may have originated as a hybrid combination between **A. utahensis** and either **A. deserti** or **A. chrysantha**. However, as far as the plants are known in native habitat, there are no recognizable intermediates between **A. arizonica** and the three other species mentioned above. **A. arizonica** appears to be a taxonomically coherent wild population, but reproducing poorly both by seed and by suckers, and obviously on the verge of extinction or without the reproductive vigor and endowment to increase under present environmental conditions. Deer and other animals eat the new, tender, flowering shoots, preventing production of seed. Indians may have cut the maturing plants for pit baking. If it is a particularly sweet kind of agave, they may have decimated the agave population during the thousands of years they occupied Arizona. We have no knowledge of this. But we do know that all such animal foragings adversely affect the reproduction of this small agave population and impair its survival. Hybridization experiments should prove informative regarding its relationships and origins.

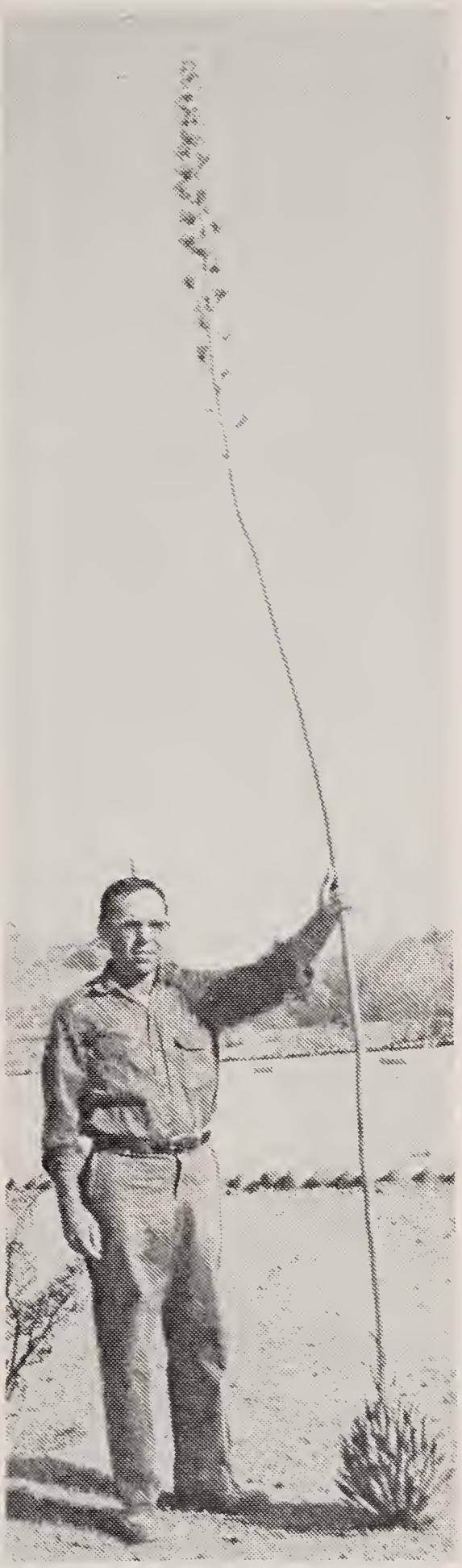

Figure 1. (Left, above) **Agave arizonica** in native habitat on a summit of the New River Mountains. Here with it are **Nolina microcarpa** and scattered plants of the very small **Agave toumeyana** var. **bella**.

Figure 2. (Left, below) Flowers of **Agave arizonica**.

Figure 3. (Right) John Henry Weber with a flowering plant of **Agave arizonica**.

Figure 4. (On page 42) Detail of the broad-leaved form of **Agave arizonica** with flowering shoot just starting.

One of the Weber introductions flowered in the Desert Botanical Garden last summer. Capsules developed, but less than 1 percent of the ovules developed into black seeds. Fertility appears to be very low. Does this species require cross-fertilization? Are the conditions here at the garden, some 2000-4000 feet lower in elevation, not conducive to pollen-tube growth? Two other mature plants, but obviously from the same clone, are preparing to bloom this summer. What will the seed set be? If a wild plant of a different clone can be found in the New River Mountains, it would prove interesting to bring pollen to our two flowering plants and observe its effect in comparison with that of the pollen from the clonal or sister plants here. A thorough investigation of **A. arizonica** and its near relatives would make a suitable thesis for one of our university graduates.

In the meanwhile, our new laws protecting our rare and endangered species may help to preserve this Arizona rarity. We will continue here at the Garden to increase our stocks and plan for the time when we will have sufficient new plants and seeds to establish a larger population in its native habitat and to distribute specimens to other constructively minded institutions. Man has made great waste on this continent, as he has elsewhere. Now is the time to come to the aid of the plant party.

Native Plants for Desert Birds

by Eleanor Radke and Lillian Diven
(Revised and expanded from December 1969 Bulletin)

From several successful desert gardeners who enjoy attracting birds to their gardens of native plants, we have collected advice on how to duplicate their successes.

The trees and shrubs in the following list provide birds with food or shelter or both. Each gardener we talked to was emphatic about the importance of water for birds, either in birdbaths, shallow pools, or "drippers", or a combination of these. Drippers can be anything as simple as a gently leaking faucet, or a Rube Goldberg contraption of copper tubing and hardware. The main thing is to attach a perch where the larger birds can sit and sip — smaller birds will hang nearly upside down to get at the dripping water.

SHRUBS THAT BIRDS LIKE

CATCLAW ACACIA (**Acacia greggii**). This is a large shrub, or a small tree, growing slowly to twenty feet high. The flowers are pale yellow spikes. Birds like the seeds, and the tiny verdin is fond of nesting in its safe prickly branches.

QUAILBRUSH (**Atriplex lentiformis**). This and other salt bushes demand full sun. It is the largest, showiest white-leaved salt bush and grows to a mound about five feet high

and seven feet wide. As the name implies, the quail are attracted to it, for its winged seeds and for shelter.

FOUR-WING SALTBUSH (**A. canescens**) is also gray, also attracts birds, but has a rangier habit.

DESERT HONEYSUCKLE (**Anisacanthus thurberii**). A shrub that the hummingbirds are mad about. The plant reaches a maximum height of six feet, but is amenable to drastic pruning which, in fact, makes it bushier and more floriferous. The flowers are two-inch-long tubes of orange and brick red, and appear almost throughout the year. Nice to look at.

HUMMINGBIRD BUSH or CHUPAROSA (**Beloperone californica**). Hummingbirds are a bonus for Arizonans. We have summer residents, winter residents and hummingbirds that just pass through, at least seven species that come to Central Arizona. Luckily, the Hummingbird Bush is in flower a long time, from December through May in protected spots. This is a beautiful and distinctive shrub, with copious tubular flowers in dense clusters, a bright red. Orioles and house finches like the sweet nectar, too.

HUMMINGBIRD TRUMPET (**Zauschneria latifolia**) became available just last year and proved as attractive to hummers in summer and fall as the Chuparosa is in winter. From July through October the upright stems of this low shrub were covered with 2-inch bright red flowers. The hummingbirds loved it.

JACOBINA **ghiesbreghtiana**, with its large orange flowers, also drew the hummingbirds, finches and orioles. Broad-leaved, two to three feet tall, it will grow in shaded areas.

ALGERITA or RED BARBERRY (**Berberis haematocarpa**). The juicy berries of this handsome shrub attract many birds in summer. It is an evergreen, three to six feet tall, and has fragrant yellow flowers from February to May, followed by the succulent red globose berries.

DESERT HACKBERRY (**Celtis pallida**). We include this with shrubs, though it grows to a many-stemmed tree twelve feet high. Again, it is the fruit which attracts the birds. Berries are sweet but rather dry. This intricately-branched shrub also offers shelter for birds.

GRAYTHORN (**Condalia lycioides**). This common shrub, very gray and very thorny, is naturally straggly and many-branched from the base, but it can easily be trained and pruned to a small tree four to eight fee tall, and a very good looking little tree it is. The frosted purple berries attract the verdin as well as a dozen other birds.

BURRO BRUSH (**Hymenoclea monogyra**). Here is a low, branching shrub, no higher than two and a half feet. The winged fruits are distinctive, and quail and other seed-eaters appear to enjoy them. Stems may die back, but quickly put out new growth which rabbits dearly love. There are both male and female Burro Brush plants, so you had better plant several.

DESERT LAVENDER (**Hyptis emoryl**). A tallish, grayish shrub, with foliage smelling like lavender (people-pleasing), and small purple bird-pleasing flowers. Both verdins and black-tailed gnatchatchers liketo nest in this shrub, and they and the hummingbirds use the woolly calyx tubes as nest lining. Desert Lavender flowers almost throughout the year, so hummingbirds include it in their daily rounds.

TOMATILLO (**Lycium spp.**). The various species of Lycium: **pallidum, fremontii, andersonii** and **cooperii**, all bear plentiful berries that many birds like to eat. From the common name you can guess that the berries look like little orange-red tomatoes. This is a somewhat straggling shrub, about a yard tall. Small white to lavender flowers in spring and again after summer rains, so that you and the birds can expect two crops of berries.

Because there are so many berries on a bush the Tomatillo looks pretty for a long time, even though the birds are busy eating the semi-annual crop.

LEMONADE SUMAC (**Rhus trilobata**). A shrubby sumac having yellow flowers, and crimson berries with which you could make a lemonade-y drink if the birds don't beat you to the fruit. Rarely over six feet tall, the Lemonade Sumac is usually only about half that height and grows comparatively slowly. An ornamental shrub that bears its fruit in the summer when the birds are thirstiest.

BUCKTHORNS, **Rhamnus crocea** and **R. californica**, with their attractive evergreen foliage and colorful clusters of juicy fruits, do best at elevations of 2000 ft. or more. Thrashers, phainopeplas and other birds enjoy the bright red fruits that ripen in late summer and early fall.

AND SOME NATIVE TREES FOR THE BIRDS

DESERT WILLOW (**Chilopsis linearis**). This past fall an uncommon migrating hummingbird stayed two months in a friend's desert garden because the Desert Willow continued to bloom through October. It is an open, many-stemmed tree, growing quite quickly to about fifteen feet. Narrow leaves and rather weeping branches. The scented pink-lavender-white flowers are two inches long, borne on large racemes, and blossom from spring through fall, although the heaviest flowering is in late spring. A number of birds like the Desert Willow, and migrating butterflies think it is a special treat.

SUGAR SUMAC (**Rhus ovata**). A small evergreen sumac, reaching about ten feet in height. It is exceptionally handsome, with shiny bright green leaves, deep red buds and long dense clusters of creamy flowers. The fruit is reddish and sweet and abundant. Like Lemonade Sumac, it sometimes bears two crops of flowers and fruit.

MEXICAN ELDER (**Sambucus mexicana**). This one needs more water than the other plants mentioned, since its native location is along stream beds, but it is worth considering for its abundant dark blue berries, its spreading evergreen foliage, and the dense shade it provides in the desert.

WHERE TO GET THEM?

When we wrote this article in 1969, we had to say that you had to grow these plants yourself from seeds and cuttings — most were simply not available. Now every one of them will be found at the Garden's Second Annual Sale of Unusual Plants on April 16th — and on the afternoon of April 15th during the preview sale for Garden Members.

News & Notes

(continued from page 39)

We strongly recommend that you come early. The extensive article in the April issue of Sunset Magazine is expected to draw large numbers of gardeners to our sale.

Two additional plant sales are to be held in Arizona during April. One will be at the Boyce-Thompson Arboretum near Superior on the weekend before our sale, and the other at the Arizona-Sonora Desert Museum on the weekend following ours. As a service to our Members, the Garden is planning a bus trip to the Arboretum sale on Saturday, April 11th. Forty reserved bus seats will be available to Garden Members on a first-come-first-served basis. A minimum of 30 reservations will be necessary. Your reservations must be made by mail and accompanied by your check for $7.00 for the round trip. Reservations must be received at the Garden by April 7th. The bus will depart from the

(continued on page 47)

Here's what the Garden did with the 20 x 20 ft. space offered to us by the "Living with Plants" show. The "indoors" section, about a fifth of the space, displayed flowering cactus plants in the arched window and our framed logo over the fireplace. "Outdoors" we arranged over 100 drought-hardy plants, most of them in flower. The pots or flats were dropped through cut-outs in the plywood platform, and the surface covered with black volcanic cinders.

The fellow in the middle of the desert landscape is Phil Schroeder who designed the exhibit. (He posed only for the one picture — he wasn't a permanent part of the display.)

You may notice a Garden t-shirt seeming to float in space through the window in one of the pictures. In fact, it was firmly pinned to the back of the Garden's information booth, across the aisle from our exhibit.

Light wood and earth colors were used throughout the construction, the plants were green and gray, the flowers were white, pink, red, yellow, orange, purple — and we would like to think that a lot of the viewers were green with envy.

Four Plants to Look For at Our April Plant Sale

by Russell Haughey, Garden Horticulturist

As you know, we are having our Second Annual "Sale of Unusual Plants," Saturday, April 16, with a special preview sale for members only on Friday, April 15, from 4:00 to sunset.

So, with that in mind, my article this month is devoted to four of my favorite plants that will be sold at the sale.

Most desert landscaping you see has pretty much the same old plants in the yard. Usually, there are a couple of saguaros, a few barrel cactus, lots of **Agave americana**, and if there is any tree at all, you can bet it is a palo verde.

There is no reason in the world why a desert yard can't have trees or shrubs. There are plenty of trees and shrubs that need little extra water once they are established, and are very compatible with cactus.

Unfortunately, most local nurseries don't stock these plants because there isn't any demand for them, even though many of them are available to the nurseryman. One of our purposes here at the Desert Botanical Garden is to make people aware of some of the more interesting desert plants that are available.

Here are four plants that you will find at our sale this April, and that I think you may want to try in your yard.

PALO BLANCO Acacia willardiana

The Palo Blanco is a slender, unarmed tree that may reach a height of thirty feet at maturity. The name Palo Blanco refers to the cream-colored, papery bark. The weeping branches and the delicate leaves make this a very beautiful plant. Our largest **Acacia willardiana** in the Garden is over twelve feet high and was planted only seven years ago.

If you feel you have to stake up this plant, do it very loosely, give the plant plenty of room to sway back and forth. This will induce the tree to strengthen its trunk as it grows.

Acacia willardiana is a native of Sonora, Mexico, and grows between Hermosillo and Guaymas, and on Tiburon Island.

SHOESTRING ACACIA Acacia stenophylla

This is a handsome desert tree native to southeastern Australia, and does very well in cultivation here in Arizona.

The combination of the gracefully pendant branches and the long, narrow shoestring-like leaves gives this plant a nice weeping habit.

The flowers occur in pale yellow heads in February. The fruit is a typical legume, about six inches long, constricted between the seeds.

This would be a good tree to plant near a pool because of the small amount of litter created. It needs only occasional watering, if any, to keep it growing. It is relatively fast growing. One plant here in the Garden has grown from a five-gallon-size plant to ten feet high in three years, with only occasional watering and will very likely grow to over 25 feet.

CHUPAROSA Beloperone californica

This is one of the dozens of plants sometimes called hummingbird bush. It is a native of southern Arizona and the Mexican states of Sonora and Sinaloa. You will find it growing along washes and on rocky slopes in association with Creosote Bush, Blue Palo Verde and Bur-sage.

Chuparosa grows best in full sun or filtered shade. Be sure to give the plant plenty of room to grow, because it may in time grow to six feet high and 15 feet in diameter. You may want to plant this bush outside your living room window so you can watch the hummingbirds visit the plant to get nectar from the flowers.

The honeysuckle-like flowers are red and tubular, just the sort of flower hummingbirds love. The flowers are also edible — they taste very much like cucumbers.

AUSTRALIAN HOPBUSH Dodonea microzyga

This is a shrub that attracted much attention during our Cactus Show this year because of its crimson fruit.

Dodonea microzyga is a dark green dense shrub that grows to six feet high, and four feet in diameter. The leaves are small, pinnately compound, dark green, and are waxy in appearance. The fruit is what makes this an especially desirable plant. From February to March, the bushes are covered with red fruit. They are about one-half inch in diameter, have three or four wings, and are crimson in color.

This plant does very well in full sun, needs little water, no pruning and little other care.

One of our Australian hopbushes here at the Garden grew from seed to six feet in seven years, with only occasional watering.

With these and other plants you will find at the sale, you can have attractive desert landscaping that doesn't look like the "old standard".

Have you questions about plants or landscaping? This column is supposed to be of service to Garden Members, so let me know if I can help you.

News & Notes

(continued from page 44)

Garden at 9:00 a.m. and return by 3:00 p.m. Refreshments will be served en route, and there will be plenty of space for carrying back your plant purchases.

If the bus trip is well attended, plans will be made to provide a similar service to Members for the sale at the Arizona-Sonora Desert Museum.

* * *

Thanks to two of Arizona's top birders and the Maricopa Audubon Society, the Garden will have a check list to offer our visitors next year. In January Bix Demaree and Helen Longstreth began a series of regular visits to the Garden with the aim of compliling a list of the bird species that frequent the Garden through the year. We couldn't have two more experienced field observers handling the task — Bix has 87 per cent of Arizona's 424 bird species, and Helen has seen 80 per cent of them. Both have birded extensively elsewhere. We are grateful to them individually, and as representatives of the Maricopa Audubon Society, as will be the increasing number of birdwatching visitors to the Garden.

KAET, Channel 8, the PBS television station located at Arizona State Uniersity, spent several days at the Garden recently filming interviews with Russell Haughey, our Horticulturist, and W. H. Earle, our former Director. The interviews will be segments of Dr. Vic Miller's new 13-week gardening program, to be offered for credit by the University this spring. You can see the programs filmed at the Garden on Tuesday, April 12 (repeated on April 16), and Tuesday, April 19 (repeated on the 23rd). We understand Dr. Miller's course will have more than local exposure, since it was filmed under the auspices of the PBS Rocky Mountain Network.

* * *

Enclosed with this issue is your ballot for casting your votes for directors of the Society. The Annual Members' Meeting will be held at the Garden on Sunday, May 8th, at 2:00 p.m. Reports will be presented by the Superintendent, the Business Manager, the Educational Director, the Librarian, Dr. Gentry, Mr. Lehr, and others of the staff and Board. Please plan to attend and give us the benefit of your thoughts on your Botanical Garden.

DESERT BOTANICAL GARDEN

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GARDEN EVENTS

		APRIL	
Tues.	**5th**	CACTOMANIACS—Meeting	**8:00 p.m.**
Wed.	**6th**	CLASS—Cultivation of Desert Trees and Shrubs	**2:30 p.m.**
Thurs.	**7th**	LECTURE—Mexican Cacti	**3:00 p.m.**
Sat.	**9th**	FIELD TRIP—Hidden Canyon	**8:30 a.m.-4:45 p.m.**
Wed.	**13th**	CLASS FIELD TRIP—Usery Mountain Park	**8:30 a.m.**
Thurs.	**14th**	LECTURE—Arizona Flowering Trees	**3:00 p.m.**
Sat.	**16th**	SALE OF UNUSUAL PLANTS for Desert Gardens	**9:00-5:00 p.m.**
Thurs.	**21st**	LECTURE—Cactus Flowers	**3:00 p.m.**
Sun.	**24th**	CAC & SS—Meeting	**2:00 p.m.**
Thurs.	**28th**	LECTURE—Arizona Cacti in Flower	**3:00 p.m.**
		MAY	
Tues.	**3rd**	CACTOMANIACS—Potluck Supper	**6:30 p.m.**
Sat.	**7th**	FIELD TRIP—Mount Ord	**8:30 a.m.-4:45 p.m.**
Sun.	**8th**	MEMBERS' ANNUAL MEETING	**2:00 p.m.**
Mon.	**16th**		
	thru	CACTUS AND SUCCULENT SOCIETY OF AMERICA	
Fri.	**20th**	National Biennial Convention, Tucson	
Sun.	**29th**	CAC & SS—Meeting	**2:00 p.m.**

Both the April and May field trips are now fully booked. We plan to organize next year's field trip program so that more Garden Members will be able to participate than has been possible in recent years.

The Garden is open every day of the year from 9 a.m. to 5 p.m. Telephone 948-2700 and 946-9942.

—— DON'T MISS THE PLANT SALE ——

SAGUAROLAND BULLETIN

MAY, 1977

SAGUAROLAND BULLETIN

Vol. XXXI MAY, 1977 No. 5

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Cover: *Abutilon pringlei*
(See page 60)
Photo Lyle A. McGill

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DESERT BOTANICAL GARDEN

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ARIZONA CACTUS AND NATIVE FLORA SOCIETY

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Emeritus: W. H. Earle, Director; Angela Bool, Reg Manning, Executive Board; Eleanor B. Sloan, Advisory Board.

News & Notes

The Garden received a very complimentary letter recently from a Prescott visitor concerning one of our ablest staff members. To quote a few lines from the letter: ". . . Mrs. Turner made my day. The enthusiasm she reflects, her graciousness, her obvious pride in the Botanical Garden, and her energy all combine to provide inspiration for one fortunate to come in contact with her."

I can only say that we knew it all along, but it's nice to hear from an unbiased and unsolicited source.

* * *

Another Garden member has been honored recently. Walter J. Groll, Sr., who has won many ribbons in the photography section of the Cactus Show and has been a Show volunteer for a number of years, has had his color print "Saguaroland in the Sunset" selected by the Arizona Department of Tourism to be the cover picture on three-quarters of a million official brochures. Congratulations, Walter!

* * *

Our second annual Plant Sale was a resounding success. Attendance at the Members-Only sale on Friday night indicated that this feature of Garden membership is greatly appreciated. Saturday's sale drew people into an impatient throng behind the barrier by 8:15 A.M. The sale was attended by several thousand buyers, sufficient to make use of our service road as a parking lot necessary for the fifth time this year. Happy buyers who had struggled through the crowds and successfully scored the last Boojum Tree or Desert Holly waited in long lines to pay for their treasures at the cashier's table. Oddly enough, many of the rarest plants were ignored because buyers didn't recognize their value. Prominent among them was **Leucophyllum laevigatum**, the Chihuahua Sage, with blue flowers and dark green foliage. Perhaps we will have to do some articles in the Saguaroland to stimulate interest in these new plants.

Still, thirty-five hundred plants found new homes during the sale. I hope many of our Members will let us know how well the different species they purchased did, and under what landscape conditions they succeeded or failed. Many of the plants available at the sale we ordered last year at this time, on the basis of demand at our first sale. The Garden staff gathered seed and

(continued on page 56)

The Effect of Light on Succulent Plants

Everyone knows that plants need light to grow and that succulents need extra-bright light, but there are many interesting reactions of plants to light that are not so widely known. Succulents, like all plants, utilize only the blue-violet and red portions of the visible spectrum. Green light is reflected from plants (that's why they look green) and so is not used. Yellow and orange light seems to have no effect on plants one way or another. Blue and violet light is absorbed by plants and used in their physiological processes — it is necessary for healthy foliage growth. Red and far-red (infra-red) light is necessary for flowering of plants.

Normal fluorescent light tubes produce high levels of blue light. Incandescent bulbs produce much red light. Used together they provide excellent artificial light for plant growth. The fluorescent tubes designed especially for plants are high in both important areas. Succulent plants grown indoors under lights need at least 10 hours of light a day. During the summer months after the plants have flowered, they can be grown under continual 24 hour lighting with no ill effects if watered regularly.

Flowering is controlled by a complex chemical system triggered by red and far-red light. Photoperiodism is the response of a plant to the relative length of light and darkness it receives in a day. One group of plants requires long nights (12-14 hours) to flower. These are called short-day plants and include the chrysanthemum and poinsettia. A second group of plants, long-day plants, need short nights (less than 10 hours) to set flower buds. The third group of plants are day-neutral — they bloom regardless of day and night length.

Little research has been done to find which group the cacti fit into. The Christmas cactus **Zygocactus truncatus** is the only species we know much about, and it is complicated by being temperature sensivitve, too. If kept at 45-55 degrees F. **Zygocactus** will flower regardless of day and night length. At higher temperatures, as would be found in most homes, **Zygocactus** must have long nights to set flower buds. This is why many people have trouble flowering their Christmas cacti. In their warm lighted homes the plants must be placed in a dark closet every night for about 3-4 weeks to bloom.

The light requirements for flowering are known for a few other succulents and these are listed below:

Ceropegia — Day-neutral

Euphorbia — The poinsettia **Euphorbia pulcherrima** is known to be a short-day plant, perhaps other species react the same.

Hoya — Day-neutral

Kalanchoe — Flowers with short-days, new plantlets are formed along the leaves only with long-days.

We encourage you to experiment with your plants and let us know of special successes or failures. We are considering presenting a special award at next year's Cactus Show to the exhibitor with the most plants in flower.

——SK

Perplexing and Vexing — Cereus, Grusonia or Opuntia?

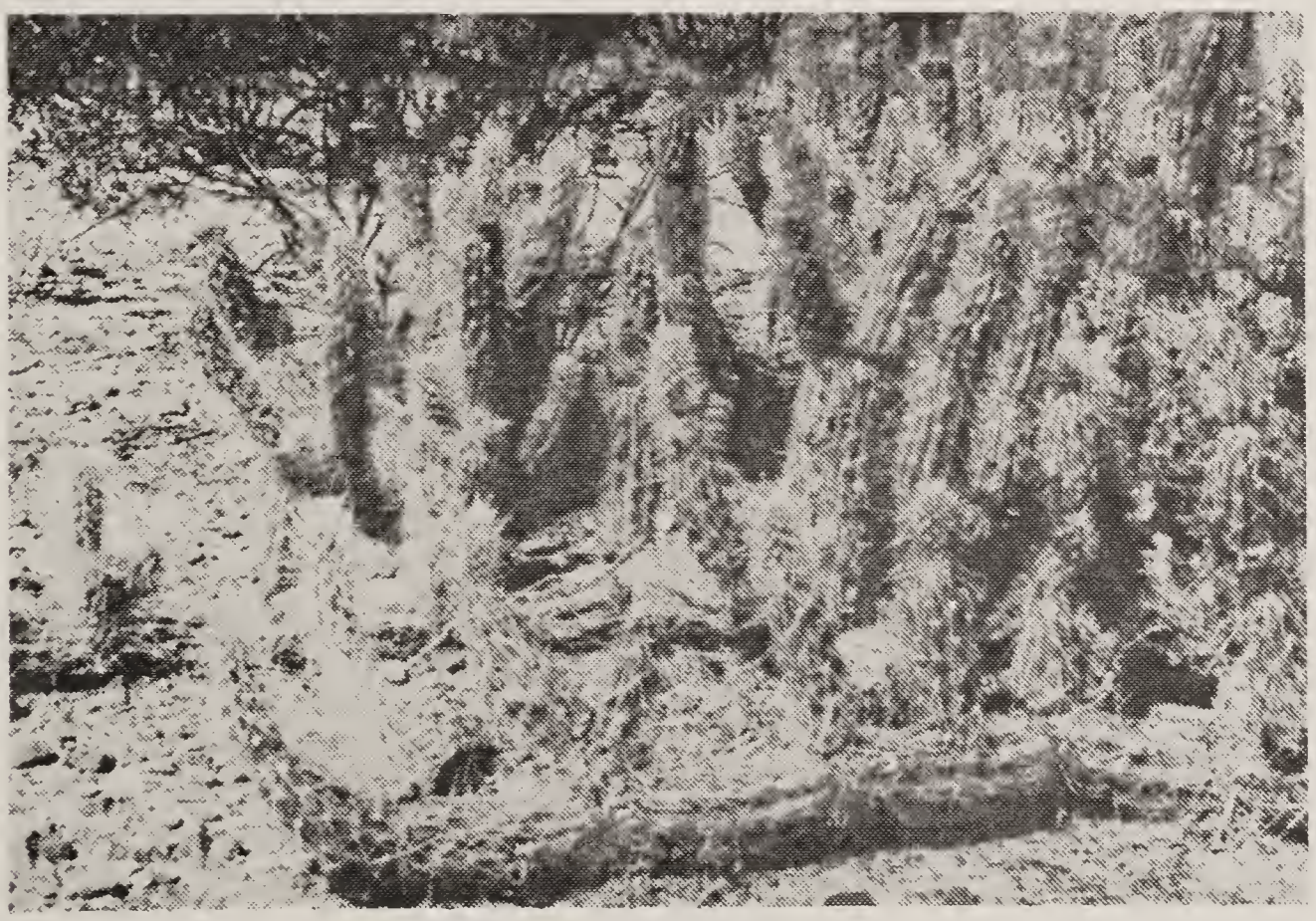
Opuntia bradtiana (Coulter) K. Brandegee is one of those difficult organisms over which biologists worry interminably. In studying the plant for the purpose of botanical description, one meets a bewildering combination of characteristics. The name used above perhaps reflects current taxonomic and nomenclatural opinion, although I am sure I could find dissenters from this statement in several quarters.

Why the problem? It begins with the fact that the stems of this cactus are terete and have eight to ten shallow ribs. One immediately says, "Aha! a cereus!" Indeed the first valid description, by Coulter in 1896, places the plant in the genus Cereus. Upon careful examination of complete specimens, however, one must consider whether the plant indeed belongs in that genus. While it is true that most of the areoles lack glochids (typical of Cereus), those which flower and those on the fruit do bear a few golden-yellow glochids (typical of Opuntia). Then, too, the fruits themselves bear large hard tan seeds in a dry fruit with a deep umbilicus, again characteristic of Opuntia. The umbilicus is a neat conical depression on the top of an Opuntia fruit, resulting from the withering away of the perianth.

The perianth, which opens in bright sunlight, is rotate, bright yellow, 3 to 4 cm wide. It encloses brownish stamens and eight lobed yellow stigmas. All in all, a rather typical Opuntia flower.

The spines are barbed as in Opuntia, but lack the sheaths typical of Opuntia.

Since the plant's mix of characteristics doesn't seem to fit neatly into a known group, the inclination is to separate the plant into a group of its own. This is what happened very early in the name game with this taxon. A Mr. Nicolai coined the



Opuntia bradtiana photographed in the Sierra San Marcos, Coahuila, Mexico, at 3600 ft. elevation. *Larrea tridentata* in background.

generic name Grusonia for this plant. Eventually several other widely disjunct taxa were found in North America and included in the new group.

Based on its odd combination of characters, this plant has been variously regarded as an advanced Opuntia, a primitive Cereus, a "missing link" between the two, an intermediate between Claviopuntia and Cylindropuntia, or simply an anomalous Opuntia neither primitive nor advanced.

In any case, this one species has been known validly or invalidly under each of the following names: **Grusonia cereiformis, Cereus bradtiana, Opuntia cereiformis** and **Opuntia bradtiana.**

Now, what of the plant itself? It is a cactus that dominates large areas of dry plains, rocky limestone slopes and mountains, primarily in the Mexican state of Coahuila, which is largely Chihuahuan Desert. It is a sprawling, thicket-forming plant similar in habit to **Cereus emoryi.** Seedlings develop into semi-erect stems up to 0.6 m tall. The elongate, blue-grey or grey-green terete stems grow vertically in 10 to 15 cm long jointed sections. Eventually the stems fall over and root along the lower surface. New stems then develop between the now horizontal joints. This branching habit is repeated until large masses of tangled stems are formed. The area covered by the spreading plant is often an acre in extent.

Typically the plant is found growing with **Agave lecheguilla, Agave falcata, Euphorbia antisyphilitica** and **Yucca endlichiana.** It is one of the first invaders of abandoned roads and burro trails because of its sprawling habit and vegetative means of propagation. It is not a pleasant plant to get around in or blunder into. The spines are sharp, barbed and brittle. They are white in color and very unequal in size, spreading in all directions. Each circular woolly areole is 10 to 15 mm from the adjoining one, and each bears a cluster of 15 to 18 slender unequal radial spines 10 to 12 mm long. There are five to seven stouter

O. bradtiana flowered in the Sierra San Marcos in early July.

central spines, also of varying length, in each areole. Central spines range from 15 to 30 mm long, with one or two of them more prominent than the others. Centrals may be terete or basally flattened.

Plants of **O. bradtiana** grow grudgingly in cultivation and are slow to re-establish from cuttings. They are also prone to sunburn at our low elevation. Their native habitat has an average elevation of 3000 feet and receives only three inches of rainfall a year, most of it coming in summer.

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Standley, Trees and Shrubs of Mexico

——RGE

GROWING AGAVE FROM SEEDS

by Charles F. Merbs*

Agaves are not the most popular of succulents and it takes a certain kind of personality to wait 25 years or more to see his plant flower, then immediately die. To the true agaveophile, the different species are very exciting, even if not always identifiable. Most agaves are relatively easy to grow although some, such as **A. attenuata** which is seen so frequently along the California coast, are unable to tolerate Arizona's extremes of heat and cold without assistance. Ninety-nine percent of the agave growers in the Phoenix area seem content to grow only **A. americana**, but the true agave fan will have 20 or more species and is always searching for new ones. Many agaves produce clones quite readily and some even produce bulbils on the inflorescence. Another but rather drastic way of getting agaves to reproduce is to remove the center of an adult plant. Just as with cacti, this stimulates the plant to produce multiple heads, each of which can then be rooted. All of these methods of reproduction have disadvantages, however. Not all plants produce clones (some of the most beautiful such as **A. victoriae-reginae** and **A. ocahui** rarely do) and even for those that do, the offsets may be poorly shaped or attached too tightly to allow separation from the parent without injury, or the offset may contain a disease gotten from the parent. Reproduction by means of bulbils gives you many plants in a hurry, but it tends to be a rare event and characteristic of just certain species. **A. murpheyi**, an Arizona native, regularly produces bulbils.

In many cases the best way to go, and in some cases the only way, to reproduce agaves, is to grow them from seed. Agave seeds are flat (usually) and black in color. I have occasionally gotten off-color (brownish) seeds to germinate, but they are usually not worth the effort. Agave seeds vary considerably in size, usually reflecting the size of the mature plant. The smallest seeds I have worked with (several species) measured less than 2 mm. in maximum diameter while the largest, from a Mexican giant, **A. franzosini**, measured more than a centimeter in diameter. As with other plants, the fresher the seeds, the greater the percentage of germination.

My soil mix for agave seedlings is very simple, equal parts of commercial soil mix and sifted (through a regular window screen) crushed granite. I cover the seeds with a depth of soil measuring half the diameter of the seed, but I doubt that such precision is necessary. They should be below the surface, but not very deep. I then set the pot (usually plastic) in a pan of distilled water or rain water until a wet surface indicates that the soil has become thoroughly saturated. After the pot is removed and allowed to drain for several minutes, I spray the surface with a fungicide (whatever is handy — agaves do not appear to be very susceptible to damping-off) and cover the pot with plastic wrap secured with a rubber band. I then set the pot on a warm windowsill (I do not have artificial lights) where it receives diffused light and wait for nature to take its course. Some seedlings have appeared as early as four days after planting, but six to eight days is more typical. If plants have not made an appearance by the end of two weeks, they probably never will. The seedlings begin with a single leaf, approximately round in cross-section, thicker near the base and tapering to a point at the top. The actual tip is obscured by the empty seed husk perched on the top of the plant. This seed remnant may remain on the plant for several months until it falls off or I get tired of looking at it and remove it. Seedlings vary considerably in size during their first weeks of life, usually reflecting the size of the seeds that produced them. Within a few days of germination, however, even the smallest of the plants will have reached the surface of the plastic wrap

if it has not already been removed. The wrap is to keep the soil damp during germination. In the case of agaves, it can be dispensed with right after germination.

Some of the seedlings have a tendency to fall over and I add some coarse sand to the pot to shore them up. After two to four weeks of development, a slit develops near the base of the first leaf and out of it comes the second leaf, this one looking much more like an agave than the first, but still elongated and devoid of marginal spines. The third leaf, when it appears, tends to be wider than the second, and it does contain small marginal spines. By the time the third leaf has made its appearance, the initial leaf has begun to turn yellow and dry out from the tip. It has done its job and it proceeds to disappear. I try to keep the soil fairly moist, but pots of seedlings have dried out completely for several days, through my neglect, with no apparent damage. The seedlings will let you know if they are receiving too much light or too little light. In the first case, they take on a purplish tinge. In the second, they turn pale. Try not to change their light regimen abruptly; do it in easy stages.

By the time the third leaf arrives, the plants begin to bear some resemblance to their parents, but they still have a long way to go. The worst part is over, however, and the prognosis for continuing development is excellent.

*Reprinted with permission from "The Central Spine", Central Arizona Cactus and Succulent Society newsletter.

News & Notes

(continued from page 51)

cuttings in the Garden and in the wild to supply the growers with the necessary propagating materials. Thelma McDougall also provided Fairy Duster (**Calliandra eriophylla**) seed for the sale.

Financially, the sale was a great success; the gross sales being over $17,000. After sale expenses are deducted we hope to be able to purchase two small gasoline-powered utility vehicles for use on the grounds to negotiate the narrow paths throughout the Garden with the heavy loads of soil, fertilizer and plants which must be moved every day. The use of these multi-purpose vehicles at special events could also greatly facilitate the flow of work.

* * *

Our Garden's new logo has attracted so much attention from visitors that we are considering printing it as a full-color poster. If you think you might be interested in purchasing such a poster, we would appreciate a phone call or post card from you.

* * *

We have received an inordinate number of telephone calls in recent weeks from excited people informing us that the Century Plants in their area are converting to giant asparagus with a phenomenal growth rate! This does seem to be an exceptional year for Agaves. Thirty or forty Agaves of several different species are flowering this year in the Garden. It is always a little sad to see the spikes form, considering the plant is dying all the while it is growing, but the sight of so many flowering Agaves is worth a visit to the Garden.

* * *

As reported earlier, flowering in the western part of the State has been spectacular in some areas. We are planning a weekend Garden expedition shortly to collect seed of some of the rare and little-known wildflowers of that area, with the intention of introducing them to the Garden and to our members and the public.

Wildflowers in Your Front Yard

by Russell Haughey, Garden Horticulturist

If your desert landscape tends to look a little too manicured and sterile, you might want to make it look more "natural" by planting some desert wildflowers in your front yard.

It is not absolutely necessary to grow wildflowers in flower beds — in fact, they look lots better if you don't. Many desert perennials are easy to grow in the open, and a few annuals are, too. Plant them in groups around those rocks by your mailbox, or under your favorite sweet acacia.

Perennial wildflowers are particularly good for planting in the open because once they are established they take very little care.

The first perennial I recommend is Desert Marigold, **Baileya multiradiata.** This is a common roadside wildflower in southern Arizona. The leaves growing at the base of the plant are grey-green and the large daisy flowers are present from March to November.

Another long-blooming perennial is the Blackfoot Daisy, **Melampodium leucanthum**. A bushy little perennial, this plant has showy white daisy flowers and blooms from March to November. It grows slowly, looks neat, and never gives you any trouble.

Plant these two wildflowers from flats or cans in the spring, and water enough to get them established. That is, don't let the soil dry out completely for the first few months. After a few months the plants will have established themselves pretty well, so you can start to taper off the water. By the end of summer, you should be watering the plants only about once a month or so.

By the next summer, the plants should be able to make it with only a few supplemental waterings. Remember, when you water, water deeply. By late November, you can prune these plants to 3-inch stubs to prepare for the spring growth.

There are three Beard-Tongue, or Penstemons, that do very well in desert landscapes: **P. parryi, P. eatoni** and **P. pseudospectabilis.** These all have perennial basal leaves and send up one to six flower stalks in early spring. **P. eatoni** has bright red flowers; **P. parryi** has rose-magenta flowers; and, **P. pseudospectabilis** ranges from deep pink to rose-purple. Clumps of these Penstemons in the Garden this spring were really spectacular. Care for these as you would the Desert Marigold or the Blackfoot Daisy. When the plants are finished flowering, you can collect the seed by cutting off the flower stalks. In October, when it is still warm, spread the seed over the surface of the soil and rake lightly. Soak the ground thoroughly and keep it moist until germination, then water often enough to keep the seedlings from wilting, probably a couple of times a week to get them started, and not so often when they are larger and the roots are deeper. Always water deeply, and try to let the plants go as long as you can without watering to help them resist drought. But try not to let them wilt.

If you add a couple of annuals, like the blue-flowered **Phacelia parryi** (on the list of free seeds that Members get when they renew membership), or Desert Poppy (available in our shop), I think you'll be pleased with how your front yard looks.

Well, happy gardening! If you have any problems, call me at 947-2800, and I will be glad to help you out.

"THE GREAT LAND RUSH"

3:59 p.m.
Ready . . .

4:00 p.m.
. . . GO!

The Members-Only preview of the Plant Sale opened at exactly four o'clock on Friday "just like the rush into the Oklahoma Territory", according to Bill Kepner who took these pictures. Well, maybe not quite like it — there was a crowd, but there wasn't any bloodshed or claim jumping. All we saw were grins of triumph as Members (with staff help) finally loaded their cars and headed home for a busy Saturday of digging and planting.

A Nursery on the Riviera

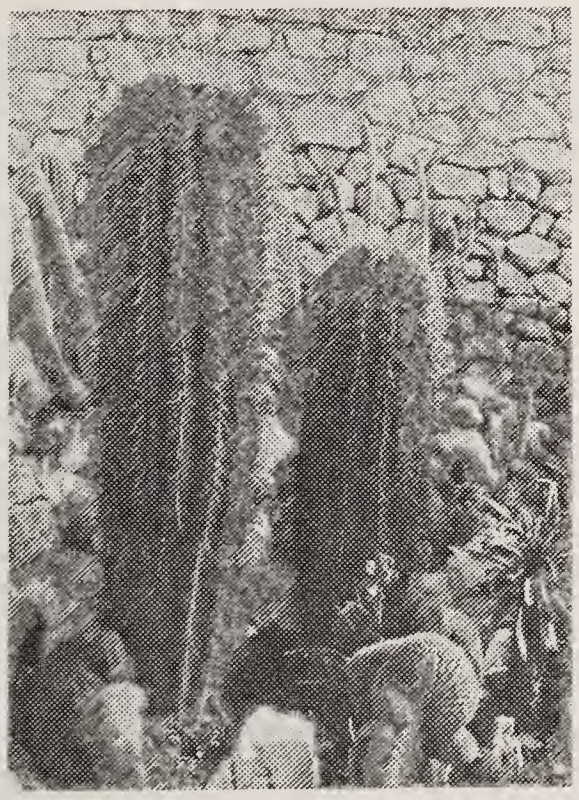
(The sixth of W. H. Earle's European reports)

Since Jurg Rau and I wanted to see commercial nurseries as well as private gardens, Dr. and Mrs. Willy Cullmann (see February BULLETIN) took us to visit Fernand Delrue's nursery at Menton. Delrue is a widely-known grower of cactus and other succulent plants, and his nursery on the French-Italian border is filled with magnificent specimens.

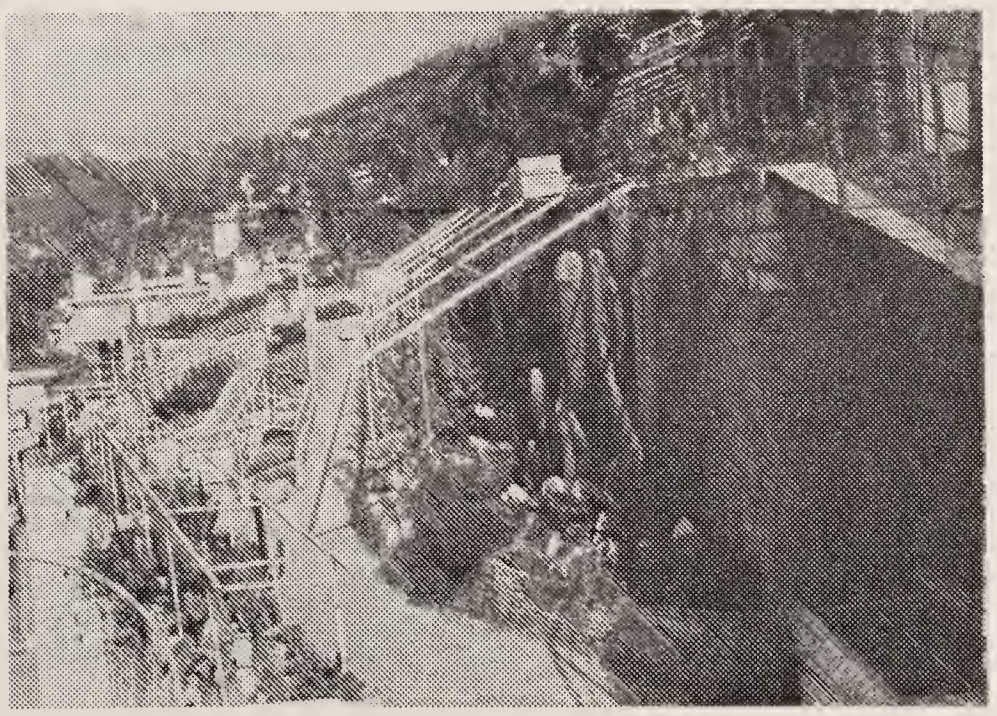
Raised stone beds line the zigzag paths that climb the steep hillside from the narrow strip of land at the water's edge. The thousands of fine plants, a surprising number of them in bloom, show how much care Delrue lavishes on his stock. Some Saguaros, grown from seed, are twenty years old and already a meter tall. They were the best-looking Saguaros I saw in Europe. The size of many specimens was impressive. Delrue had a very attractive crested **Myrtillocactus geometrizans**, on its own root, that was only slightly smaller than the fine specimen I saw at "Les Cedres".

This area has long winter rains, so cactus must be protected, although yuccas, cordylines, agaves and aloes are not harmed. Metal frames that can be covered with glass keep the plants dry during the winter — the glass is removed when warm weather approaches.

It was hard to resist the temptation to get some of Delrue's lovely plants, though I knew I couldn't bring them home. Most of them are winners.



At left, two very fine young Saguaros Delrue has grown from seed. Below, the nursery uses every bit of available space. Notice the framework for the rainy-season protection of the cactus plants.



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GARDEN EVENTS

MAY

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	thru	CACTUS AND SUCCULENT SOCIETY OF AMERICA	
Fri.	**20th**	National Biennial Convention, Tucson	
Sun.	**29th**	CAC & SS—Meeting	**2:00 p.m.**

Central Arizona Cactus & Succulent Society meetings
June 26th, July 31st and August 28th, 1977
No Classes or Lectures given from May through October, but the GARDEN is open daily. For any additional information, phone (602) 947-2800.

This Month's Cover

Interesting in detail, this Indian Mallow, *Abutilon pringlei*, is rather disappointing as a whole, at least to a desert gardener. We grow it at the Garden, but we doubt if it will ever attract much attention horticulturally. The very attractive flowers, orange and maroon, are only a half-inch across and appear sparingly over a period of months, so the shrub is never really colorful. One of the shrubs photographed for an article in the August-September 1971 Saguaroland Bulletin was about four feet tall then. Today it is about four feet tall. It has widened into a roughly hemispherical shape and has perhaps added four inches to its height, but it's one of our slowest-growing shrubs.

John H. Weber, in writing the 1971 article, suggested *A. pringlei* as a possible subject for bonsai, and since its virtues can best be appreciated close up that does seem to be the best way to use this Arizona desert native plant.

SAGUAROLAND BULLETIN

JUNE-JULY, 197

SAGUAROLAND BULLETIN Editor, Lillian Diven

JUNE-JULY, 1977 Vol. XXXI No. 6

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Cover: *Cereus marginatus,* formerly *Lemaireocereus,* from central and southern Mexico. Photo W. H. Earle.

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Individual . . . . . $ 15.00
Family . . . . . $ 20.00
Sustaining . . . . . $ 50.00
Benefactor $100.00
Elementary or
High School . . . . . $ 3.00

LIFE MEMBERSHIP
$500.00

PATRON MEMBERSHIP
$1,000.00

Corporate Memberships available in Benefactor and Patron categories.

Superintendent . . . . . Rodney G. Engard
Research Botanist . . . . . Dr. Howard S. Gentry
Curator of Herbarium . . . . . J. Harry Lehr
Educational Director . . . . . Sherry Krummen
Assistant . . . . . Christina Dezelsky
Horticulturist . . . . . Russell Haughey
Assistant . . . . . Kevin Behm
Staff . . . . . Barry Feldman, Mark Holman, Kenzie Kalt, Bill Kepner
Bookkeeper . . . . . Janice Moats
Secretary . . . . . Dorothy Brown
Bookshop Manager . . . . . Lynn Trainum
Staff . . . . . Lela Turner, Ann Shelstad

Librarian . . . . . Elizabeth Fritz
Public Relations . . . . . Carolyn Hoppin

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ARIZONA CACTUS AND NATIVE FLORA SOCIETY

EXECUTIVE BOARD: Chairman of the Board, John Rhuart. President, Mildred F. May. First Vice President, Edward Burrall. Second Vice President, Henry Triesler. Treasurer, Thomas A. Goodnight. Assistant Treasurer, Alice Feffer. Secretary, Lillian Mieg. Chief Counsel, Richard B. Snell. Margaret Caldwell, W. H. Chester, Barbara Kaiser, Naomi Kitchel, Eric Maxwell.

ADVISORY BOARD: James Cahill, Lillian Diven, Geraldine Eliot, Donald W. Hutton, Charles F. Merbs.

Emeritus: W. H. Earle, Director; Reg Manning, Executive Board;
Mrs. Charles Gilliland, Les Mahoney, Eleanor B. Sloan, Advisory Board.

ANNUAL MEMBERS' MEETING

The Annual Members' Meeting was held in the Garden's Webster Auditorium on Sunday, May 8th, 1977. Board Chairman John Rhuart opened the meeting, which was subsequently presided over by Board President Mildred F. May. Mailed-in ballots were counted by Alice Feffer and Marie Gentry. Thomas Goodnight and Mildred May were re-elected for three-year terms on the Board of Directors.

Garden Superintendent Rodney G. Engard presented a report summarizing Garden activities during the past year, leaving details of these activities to the reports of the heads of various departments, which were then presented to the Members attending. Reports were heard from the Garden Horticulturist, Education Director, Agave Project, Herbarium, Library, Bookshop and Public Relations. (Details of these reports will be found in this issue of the Bulletin.)

Mr. Engard announced the city of Phoenix' approval of the Board's decision to start immediately to charge admission to non-members. Although suggested voluntary admission has been $1.00 for adults for some years, the average visitor during the last Cactus Show, to give an example, contributed only thirteen cents. The Garden has to depend on admissions for part of its operating expenses, and since comparable insitutions have found that fixed admission charges do not affect attendance, the Board decided to institute them.

Mr. Engard presented the Garden's financial report for 1976-77. Comparisons with the previous year show improvement in all areas (See Superintendent's Report).

Members attending the Meeting were enthusiastic about plans for opening the Garden earlier during summer months, scheduling more one-session to six-session classes on evenings and weekends, proposed individual shows for what have been the Art and Photography sections of the Cactus Show, and a possible dinner celebrating the Garden's 40th Anniversary during the coming year. After the meeting was adjourned, Garden and Board Members were served refreshments.

ANNUAL BOARD MEETING

The Annual Board Meeting was held in the Richter Library immediately after the Members' Meeting on May 8th, 1977. Margaret Caldwell presented the nominating committee's slate of officers for the coming year. The Board approved the recommendations. The officers for 1977-78 are: Chairman, John Rhuart. President, Mildred F. May. First Vice President, Edward Burrall. Second Vice President, Henry Triesler. Treasurer, Thomas Goodnight. Assistant Treasurer, Alice Feffer. Secretary, Lillian Mieg. Chief Counsel, Richard B. Snell.

The Board approved the Garden's financial report and commended the Superintendent and staff for their excellent work.

Full Board Meetings each month are no longer considered necessary. Board Meetings will now be held quarterly, the next one scheduled for August.

SUPERINTENDENT'S REPORT

The Garden has made substantial progress in several areas this year. This progress has been made possible by the overall increase in income from all sources of $61,000. Most of this income was generated from the combined growth of bookstore sales, Cactus Show receipts and Unusual Plants Sale. Much of these funds were expended in making

needed improvements on the grounds, buildings and equipment or were set aside for use during the summer when Garden income drops. Improvements included the new Smith Student Entrace. Costs everywhere rose.

The adoption of a registered emblem for the Garden has been a boon to our publicity. It gives a unified public image which has already become widely known as the result of our handsome T-shirts being worn by staff members and the public. The Garden's public relations budget has expanded to include distribution of our brochures in 290 Valley locations. This is, I am sure, partially responsible for the increased sales in the bookstore and visitors to the Garden.

Two major decisions by the Board should influence Garden revenues on the positive side next year. One, the decision in May, 1976 to raise membership dues, which was necessitated by rising costs of production of the Saguaroland Bulletin, this despite the new, less expensive, format. The second decision, just announced and approved by the City of Phoenix, is the institution of an admission fee of $1.00 for adults and $.50 for children between the ages of 5 and 15. There will be no admission fee for Garden Members, of course, or their guests. Organized school groups will continue to be admitted free.

Goals for the coming fiscal year include paving and seal-coating paths in the Garden and the existing parking lot which have deteriorated. Completion of the Burrall paths, walks, and plant displays in the main arroyo is slated this summer. As all who participated in this spring's activities know, we need an additional auxiliary parking lot, but this may have to wait. Supplies for extending the drip irrigation in our developing Australian Section have been acquired for installation this summer, also.

It is the intention of the Staff to increase the public's use and appreciation of the Garden by providing more classes and more convenient open hours this summer as well as new and interesting classes. Notification of these classes and changes will appear in the Saguaroland Bulletin. An aggressive drive through the various media is also to be launched to increase membership.

More details on the Garden's activities during the year, and activities for the coming year, may be found in the individual reports that follow.

Rodney G. Engard
Superintendent

The following financial report covers the eleven months from May 1, 1976 to March 31, 1977. Last year the Board of Directors changed the existing May-through-April fiscal year to an April-through-March year. This was done so that the Garden could prepare records and reports more efficiently for the Society's directorship, federal agencies and state agencies. In the future, financial reports will cover the period from April 1st through March 31st.

Some explanatory notes on the financial report: Under Assets, the V.N.B. savings account is set aside for building and paving. The Western Savings account is a roll-over account for meeting costs of the Garden's retirement plan, due in May. Under Income, the lack of income from the National Science Foundation merely reflects a change in N.S.F. rules for indirect costs. The Grant still continues. Under Expenditures, the amount charged to Public Relations includes development of our logo and construction of both the indoor-outdoor display first used at the Living with Plants exhibit and the traveling display used frequently since it was built last summer. Both displays will see repeated use – the indoor-outdoor display will be seen at the State Fair next fall.

Although it may appear that the Garden spent more than it brought in during the past eleven months, this is not the case. Funds were transferred in advance into savings

accounts for expenses during the coming summer months when our income is invariably insufficient to cover operating expenses of the Garden. This will be reflected in next year's report.

For this report, projected expenses for General and Administrative include insurance of the grounds, medical and retirement insurance, and utilities. Projected taxes and licenses include payroll taxes and sales taxes.

ARIZONA CACTUS & NATIVE FLORA SOCIETY, INC.
SPONSORING THE
DESERT BOTANICAL GARDEN
FINANCIAL REPORT
5-1-76 — 3-31-77

ASSETS:	
Accounts Receivable	$ 160.97
Inventory, Sale Items	32,176.38
CASH	
V.N.B. Checking	7,870.81
Petty Cash, Pop Machines & Registers	575.00
SAVINGS	
V.N.B. Savings	23,642.89
First Federal (Certificate of Deposit)	6,600.00
First Federal (Life)	3,561.44
Library Fund	2,858.04
Plant Acquisition Fund	240.53
Western Savings	12,823.96
	$ 90,510.02
LIABILITIES:	
Accounts Payable	$ 0
Arizona State Comp. Fund	103.21
Arizona State W-H Tax	459.70
Arizona Unemployment Tax	485.73
	$ 1,048.64
INCOME:	
Retail Sales	$152,068.87
Sales Tax	5,899.06
Voluntary Admissions	44,364.92
Wholesale Books & Seeds	5,184.10
Memberships	10,662.60
Contributions	5,595.62
Interest, Endowment (Webster Trust)	12,374.70
National Science Foundation	0
Reimbursements & Misc.	5,498.91
Cactus Show	1,802.81
Transfer from Savings	21,552.28
	$265,003.77

EXPENDITURES:

Purchases for resale	$ 94,160.34
Arizona Sales Tax	5,899.06
Net Wages	64,011.12
Payroll Taxes & Permits	23,638.45
Supplies, Postage, Repair, etc.	8,406.43
Printing	2,450.71
Stationery Supplies	2,362.50
Saguaroland Bulletin	1,727.93
Utilities	8,730.47
Insurance & Retirement	17,569.94
Insurance, Building	2,740.00
Travel & Entertainment	2,399.71
Public Relations	5,379.65
Membership	692.47
Cactus Show	1,738.48
Professional Services	1,803.68
Garden Improvement & Maintenance	13,801.90
Building Improvement & Maintenance	1,567.45
Fleet	2,828.75
Furniture & Fixtures	6,467.31
Library Books & Supplies	1,126.99
Herbarium	428.33
	$269,931.67

ATTENDANCE: 110,527 persons contributed $44,364.92, or approximately .41 per person.

Transferred to savings: $17,258.86

PROJECTED INCOME

Income from Store	$199,922.28
Admissions	75,000.00
Wholesale	6,446.92
Memberships	12,983.85
Contributions	6,962.85
Interest	499.60
National Science Foundation	3,000.00
Reimbursements & Misc.	7,000.00
Webster Trust	12,000.00
	$323,815.50

PROJECTED EXPENSES

Purchases for Store	$125,369.69
Payroll	77,040.25
General & Administrative	49,938.65
Saguaroland Bulletin	2,456.59
Membership	859.62
Cactus Show	2,002.32
Professional Services	2,111.02

Taxes & Licenses	35,649.58
Garden Improvement & Maintenance	15,453.80
Building Improvement & Maintenance	1,824.15
Fleet	3,413.90
Furniture & Fixtures	2,940.75
Library	360.00
Herbarium	360.00
Public Relations	6,100.00
	$325,880.32

NATIONAL SCIENCE FOUNDATION
ANNUAL REPORT

INCOME:		
Cash on Hand		$4,236.02
Received		5,313.09
		$9,549.11
EXPENSES:		
Salaries	$3,242.20	
Indirect costs	384.93	
Supplies, expenses	369.11	
Field trips	150.00	
Illustrations	378.41	
Professional services	301.94	
		$4,826.59
		$4,722.52

Horticulture Department Report

The 1976-77 year was a busy one for the Garden crew. The summer of 1976 was devoted to construction. Some of the narrow paths were widened and others were prepared for paving. The Fouquieria beds were constructed and will be planted soon. We spent four weeks preparing the construction site for the student entrance and installing the plumbing for the drinking fountains.

Most of the Fall and Winter months were spent on Garden maintenance. 60 percent of the Garden was weeded and sprayed with a pre-emergent herbicide. Building maintenance was caught up, and the new offices were prepared for move-in.

The wildflower beds were planted and much time was involved in watering and weeding the beds. (The resulting color display this Spring was very satisfactory). In the main arroyo, the Burrall bird trail was staked out, and old plants were moved and new ones planted in preparation for construction this Summer.

Spring was spent setting up and participating in a series of special projects, in addition to our regular duties and maintenance that could not wait until Summer. Most of the month of February was spent preparing for what would be our most successful

Cactus Show ever. Many new tables had to be constructed and shelves were built to replace those worn out by long usage. During March, we constructed a display for the "Living with Plants" show held at the Civic Plaza, and members of the Garden staff answered questions that were asked by hundreds of people who wanted to know more about drought-hardy trees and shrubs. In April the Garden acquired the Herbert J. Bool collection of cacti, partly by gift and partly by purchase. Over 320 cactus and other succulents were given for the Garden collection, and the last of these plants has just been put in the ground. Later in April, we held our second annual "Sale of Unusual Plants." Many of the purchased Bool plants were sold during the plant sale and defrayed the cost of the entire purchase. In addition, we salvaged close to 100 cactus from the Central Arizona Project right of way near Tonopah. These plants have been planted on the Arizona floral trail to replace rabbit-eaten cactus.

Since this time last year, Kenzie Kalt and Mark Holman were added to the Garden crew as full-time gardeners. Bill Kepner and Barry Feldman, both ASU students, were hired part time. Just recently, Kevin Behm has been hired as Assistant Horticulturist. Much of my time the last year has been spent training the crew.

Accessions Report

Since April of 1976, the Garden has acquired close to 900 new plants through purchases, donations and the collections of the Garden staff.

Besides the Bool collection, confiscated plants have been donated to the Garden by the Arizona Commission of Agriculture and Horticulture. We now have a fine collection of 98 Lithops, with data, that were purchased from Ed Storms of Ft. Worth, Texas.

Ron Gass, of Mountain Wholesale Greenhouses, has donated 159 trees, shrubs, Yuccas, Agaves and Aloes to the Garden in the past year alone.

Ninety rare cactus and other succulents have been purchased from The International Succulent Institute.

Goals for 1977-78

Now that the Garden crew is large enough, and is fairly well trained, I plan to divide the Garden up into sections of responsibility. Every four months the crew will rotate sections. A demonstration garden will be built in the main arroyo, and more benches will be placed around the Garden. Much of the Garden will be put on drip systems to save time watering and weeding. A new water line will be run to the front gate and a drip system installed. The front gate beds will be landscaped and some landscaping will also be done along the entrance. Beds by the parking lot will be improved to give visitors a good first impression. The wildflower beds will be restricted to one species per bed. This will make it easier to remove the early flowering wild flowers without disturbing the late bloomers. Seed collection will be much easier, and the visitors will have an easier time deciding which sign goes with which wildflower.

Russell A. Haughey
Horticulturist

Education Department Report

Until last summer, I was in the process of completing the cataloging of all Garden plants. As of May, 1976, the Garden contained about 1,000 different species of cacti, 600 species of other succulent plants and 275 species of desert trees and shrubs. We had approximately 10,000 accessioned plants on the grounds. Accession records are now kept by the Horticulture Department.

With the completion of the plant recording, much of last summer was spent preparing new displays in the auditorium, as well as preparing copy for about 300 plant labels now in the Garden.

In October I was made Educational Director. Since then I have taken over the weekly slide lectures and (with the help of Russ Haughey), the field trip schedule. The last series of classes had 33 people enrolled. Nine new information bulletins covering desert gardening have been written and printed. These will be sold in our store as a collection as well as used in classes, for handouts during special events, and as written answers to questions we receive. More and more time is spent with people who have questions about desert plants and gardening — both in correspondence and on the phone — as the Garden becomes even better known to the public as a source of information.

For a time last spring and fall, I tried to give guided tours to all interested school groups. This took up too much time and has been discontinued. Currently, guided tours are available only to classes studying horticulture, botany or desert biology and to organized clubs. About 40 such tours have been conducted in the past year. I spoke at 12 meetings away from the Garden.

A paper on the Garden's educational activities was presented at the American Association for the Advancement of Science Annual Convention in Denver in February. This was a special section covering educational programs of museums, zoos, and botanical gardens.

In April I attended the annual convention of American Association of Botanical Gardens and Arboreta in St. Louis. I will present a written report on this at a later date.

Other activities included work on exhibits and seminars away from the Garden. There were a number of television interviews.

A list I compiled of poisonous plants in Arizona was sent to St. Joseph's Poison Control Center. The same list was used in a Poison Seminar at St. Luke's Hospital and a seminar for the nursing department at ASU. One of the television appearances was in connection with a segment on commonly-cultivated poisonous plants.

The past year we have coordinated the seed collecting, cleaning and dispersal. Our institutional seed list contains 73 species this year and we are already getting many requests for seed. The list was enlarged this year to include a description of each plant offered, climatic information on the Garden and a cover drawing of a devil's claw fruit done by Tom Caldwell. We received different species of seed in exchange from other botanical gardens. These were planted last spring and now some of the plants, all new to this area, are ready to be planted out.

The members' seed list contains ten selections, and renewing members may choose four species (instead of two) this year. Local nurseries are becoming interested in drought-resistant plants and we have furnished several nurseries with seed and cuttings.

Recently, Christina Dezelsky has joined the staff as a part-time assistant in this department. With our expanded programs, there will be more than enough for her to do.

In the coming year, we expect to develop a docent program so that informed guides will be available for all school groups touring the Garden; increase the field trip schedule to two trips per month; greatly enlarge the class schedule (15 classes are being considered for the next year including night, weekend and children's classes); label most of the plants along the paths; and construct new displays in the auditorium.

Sherry Krummen
Educational Director

(The Library Report will appear in the next issue of the Bulletin)

Agave Project Report

The principal accomplishment during the last ten months has been the preparation of the taxonomic revisions of five sections of the genus **Agave**. These are part of the text for a general account of the Agaves of Continental North America. They make up about 300 MS pages with numerous illustrations consisting of charts, maps, photos, and line drawings prepared by Wendy Hodgson.

A monographic account of the Agaves of Baja California was put into final form, following review and commentary by Drs. Donald Pinkava and Ried Moran. The MS has been sent to the California Academy of Sciences in San Francisco to consider for publication.

A short non-technical account of the Agave Family in Baja California was prepared upon request as part of a general biological publication on the natural history of Baja California for the Mexican Cactus and Succulent Society.

During this interim, Gentry has participated in two national panels for the National Academy of Sciences towards preparing technical reports on the rubber plant, guayule, and the oil nut of the desert, jojoba. These were part of a national plan to develop these two plants as renewable natural resources to supply products in critical short supply in our agro-industries. A multi-million dollar appropriation is now being formulated by Congress, much of which will be directed towards the guayule and jojoba projects.

I would like to see more economic desert plants featured in our Garden. Some examples are: guayule, chiltepines, devil's claw (Indian cultivars with edible seeds), saiya, tepary beans, Hopi maize, and so on. These could be most effectively developed as a special section of our garden in our deeper soil. Such a display would be of prime educational value to students and visiting adults.

H. S. Gentry
Research Botanist

Herbarium Report

The herbarium continues its growth and in all probability it will contain over seventeen thousand specimens at the calendar year's end. We add approximately two thousand numbers a year to our totals and this in itself is an achievement, for in one respect we differ from most other herbaria. The majority of them are units in the learning facilities at most of the high level educational institutions and therefore they have a large student body actively engaged in collecting as it relates to their studies or research. In our instance, our collections are limited to those of our staff, aquisitions received from other institutions through exchange agreements, and contributions.

During the past year we have prepared a taxonomic file listing all species represented in our herbarium. This will eliminate needless handling of our herbarium sheets in an effort to locate questionable species collections and lengthen the life of our equipment.

In conclusion, the past year wholly satisfied our expectations and we anticipate continued progress in the coming year.

J. Harry Lehr
Curator

Bookshop Report

Remodelling the Bookshop this year and improving the quality and variety of the merchandise has resulted in increased sales receipts. Garden visitors seem to find the Bookshop an attractive place to browse, and it is certainly easier for us to display what is on sale. The remodelling also has made it more pleasant for the staff. On the new book

racks we display more than twice the number of books we did before. We now have two redwood stands where we display a good variety of cactus and succulent plants for sale, and glass-fronted cases for the more valuable or fragile items.

The sale of boxed cacti was always profitable, but we dropped this item last year when it became Garden policy not to deal in wild-collected plants, and all available suppliers of boxed cacti included such plants in their selections. We carried no boxed cacti for four months, at a noticeable loss of income, until we could arrange to be supplied with a steady source of boxed cacti that were all nursery-grown. The new plants are not only more attractive, they are healthier.

Lynn Trainum
Bookshop Manager

Publicity For The Garden

Since the start of this year, shows featuring the Garden have appeared on all five local TV channels as news items with some frequency, and more people have discovered that we have people at the Desert Botanical Garden who can answer all kinds of questions relating to arid region plants. Questions are frequent since desert and drought-resistant plants have recently been recognized as useful.

Our added publicity helped increase the attendance for the 1977 Cactus Show — around 11,000 higher than in previous years.

Our first TV contact developed when Mr. Lehr brought in a copy of Retirement Living, a magazine for retired people, which recommended collecting cactus in the wild as an interesting hobby! Channel 10 — KOOL — agreed that Arizona's native plant laws should be explained to winter visitors, and the resulting story was used by CBS nationally. Subsequently, a team from CBS-New York visited the Desert Botanical Garden, although they gave no credit line.

Before and during the Cactus Show, we worked closely with The Phoenix Gazette, co-sponsor of the Show. Five hundred posters were printed by The Gazette and distributed by Garden volunteers.

Contact was made with local TV stations, and public service announcements, including color slides, were given to the stations' public announcements editors.

Two TV interviews were broadcast preceding the Show, one with Henry Triesler and Sherry Krummen, the second with Sherry and Lela Turner. Other stations also covered the Show.

We also received excellent newspaper coverage, and Goldwater's department store in Scottsdale gave us Show Week publicity with a window display of cactus and fashions.

Later, additional Garden TV exposure came via separate interviews with Sherry Krummen and Dr. Gentry, and the filming of 2 segments of the PBS gardening program here at the Garden. Our Plant Sale received attention from television and newspapers locally, and Sunset Magazine devoted two pages of photos and information to the Sale in their April issue.

The travelling Garden display continues to be used where it will bring the Garden to the attention of the public. The new indoor-outdoor display (pictured in the April Bulletin) was seen by 20,000 people during the Living with Plants exhibit.

We hope to schedule several new events during the coming year. They will include summer classes, separate art & photography shows, and a show of fine botanical prints from the Richter Library. Future projects include development of a year-round program that would attract a substantial attendance and **membership** from the year-round residents of Phoenix, so that the public will recognize us as a place to come for information, education and enjoyment of the desert.

Carolyn Hoppin
Public Relations

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DESERT
BOTANICAL
GARDEN

MRS R. IZER TURNER JAN
324 W. SIESTA WAY
PHOENIX, ARIZ. 85041

P.O. BOX 5415
PHOENIX, AZ. 85010

GARDEN EVENTS

DYEING WITH DESERT PLANTS — a special summer class will be held at the Garden on four consecutive evenings, Monday June 20 through Thursday June 23, 7 to 9 p.m. Instructor is Hank Giesecke, teacher of dyeing and weaving. You will be introduced to plants growing in the Garden and elsewhere in the desert, you will process them to make dye and then actually dye different fibers.

Fees for this class are $10.00 for non-members, $5.00 for Garden Members. (We will supply all materials.) Enrollment is limited to 15, so reservations are essential. Additional classes will be set up if there is sufficient interest.

The first of a number of Garden **WORKSHOPS** took place on Saturday, May 28. Announcements were sent to Members in the eastern area of the Valley, Cactomaniacs, field trip participants, as well as the media, and were posted in the Garden.

This was a **HERBARIUM TECHNIQUES WORKSHOP**, a full day of learning how to prepare and press plant specimens, use a variety of plant presses, mount specimens and preserve them. A follow-up meeting of the class was held to check work and discuss results. There was a fee of $5.00 for non-members, $2.50 for Members.

Announcement-by-mail was used because the event could not be scheduled until after the Bulletin deadline. There may be a few other occasions during the coming year when the Garden can schedule one-session workshops or classes only on short notice, so if you'd like to be put on the mailing list, please drop us a line. The Herbarium Techniques Workshop will be repeated if more Members are interested.

The Garden is open every day of the year. Telephone 947-2800 or 946-9942 for information.

SAGUAROLAND BULLETIN

AUGUST-SEPTEMBER, 1977

SAGUAROLAND BULLETIN Editor, Lillian Diven

AUGUST-SEPTEMBER, 1977 Vol. XXXI No. 7

DESERT BOTANICAL GARDEN

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Cover: *Agave potrerana* (see pages 75 and 76).

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ANNUAL MEMBERSHIP
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ADVISORY BOARD: James Cahill, Lillian Diven, Geraldine Eliot, Donald W. Hutton, Charles F. Merbs.

Emeritus: W. H. Earle, Director; Reg Manning, Executive Board;
Mrs. Charles Gilliland, Les Mahoney, Eleanor B. Sloan, Advisory Board.

News & Notes

This is the first issue of the Bulletin to have a color cover. From time to time we will use color again, as individual cover photos dictate. This **Agave potrerana**, we felt, was too striking to be relegated to reproduction in shades of gray. It was photographed in the Sierra del Carmen of northern Mexico by David Riskind of the Texas Parks and Wildlife Department.

* * *

As you well know, the summers in Phoenix are HOT. As a consequence of this obvious fact, attendance at the Garden is usually limited to a stalwart few — mad dogs, Englishmen and employees. To encourage summer attendance, the Garden extended its hours until sundown, first on weekends only, and after July 15th on weekdays, too. This has resulted in more visitors during the comparatively cooler hours.

Our Education Department developed summer workshops for both adults and children, and the response to these new programs has been gratifying. The June workshop with natural dye plants was such a success, and so many people had to be turned away, that it was repeated in July. The earlier class in herbarium specimen preparation and identification will also be repeated in September. Call the Garden for more information. As for the Children's Workshop, the staff was exhausted but the children and their parents were pleased, and we expect to have more next summer.

* * *

The new calendar of Garden events, which Members have already received, announced many new or expanded classes for the coming months, some new activities, and the rearrangement of some regular activities that are worthy of notice.

This year the Garden will present the photography and art shows separately from the Cactus Show in order to give each the staging and attention it deserves. Preparations have already been begun by Dorothy O'Rourke for the photography show and Kyrybel Amberg for the art show.

Few people have been aware that the Garden's Library contains a wide range of botanical art — hand-colored engravings, woodcuts and original drawings from the collections of Max Clemens Richter and Rose Collom. Starting with the Members' Preview on September 9th, the Garden will display many of these treasures in a Botanical Art Show that will be on exhibit until October 23rd.

The botanical prints date from 1750 to the present. In addition, our Library contains illustrated botanical books that are as much as two hundred years older, and some of these will also be on display.

(continued on page 82)

AGAVE POTRERANA, THE PASTURELAND AGAVE

by Howard Scott Gentry

Until recently, **Agave potrerana** has scarcely been known or recognized, but it already has a short botanical history, which I will recount here. Trelease named and described the species in Standley's Trees and Shrubs of Mexico (1920). He based his name on a single collection of the grand old Yankee plant collector, Cyrus Guernsey Pringle, who, on 10 September 1886, collected the plant near Potrero Peak on the Santa Eulalia Mountains, some ten to 15 miles southeast of Chihuahua City, Chihuahua. Pringle wrote in his journal (Davis 1936 p. 34). "Friday, September 10. We went by train to Mapula (RR station), thence walked some three hours to the highest peak of the Santa Eulalia Mountains, on the summit of the mountains collecting 803 **Allium scaposum** Benth., and on the ledges of the peak 802 **Agave kerchovei** Lem." Trelease cites this collection as the type, but the number is misquoted as "302," which, in Pringle's list (Davis 1936 p. 478) is used for three other plant species, and the Trelease misquote should be corrected to 802. Pringle distributed this collection as **Agave kerchovei** Lem., a similar-appearing species from Puebla and Oaxaca. Duplicate specimens of Pringle (he collected in sets of ten or more) may still be found under this older name in some herbaria, the curators still not knowing they have isotypes of **A. potrerana**. Corrections are in order here, also, because with more recent collections, the species is shaping up as a good one, quite distinct from **A. kerchovei**.

With these taxonomic bones restructured we can look at the plant itself. **A. potrerana** is a beautiful agave, especially when it flowers, as our cover picture shows. Out artist, Wendy Hodgson, has provided a very accurate illustration of leaves, flowers, capsules and seeds, Figure 1. It shows clearly that the plant belongs in the spicate subgenus Littaea, and the section Marginatae, having the leaves lined with a corneous margin. Like other freely seeding wild agaves, however, it is variable; the leaves are short (30-40 cm) or long (70-80 cm), with large or small teeth. Sometimes the teeth are very small and few or remote. Flower color may be greenish yellow, or reddish, or orange, a reddish color even persisting in the dried flowers. The flowering period is generally summertime, as flowering specimens have been found from May on well into August. The rosette develops many leaves through its lifetime of 15 to 20 years, and may reach a height of 1 m and be about twice as wide with rigid spreading leaves, though most plants are smaller. The plants sucker sparingly or not at all, require little water, are quite cold hardy, and will add interest to the outdoor succulent garden.

What has been regarded as a rare plant is now known by recent collections to have a broad range in the mountains of northern Mexico, map, Figure 2. It occupies elevations from 5,000 to 8,000 feet above sea level, characteristically in grassland with oaks, junipers, or pines and scattered chaparral shurbs. Geographically and ecologically, it is well named, as "potrero" means pastureland, so **Agave potrerana** translates as pastureland agave. The mapping is based upon herbarium specimens. The representative collection from south of Creel is from young sterile plants and is, therefore, not as positive as the others. Another leaf specimen in the National Herbarium collected by J. N. Rose, he cited as from "El Paso" only. I have searched for the plant on both sides of the border about El Paso, Texas, without success. Rose was very careless about his locality citations. The plant is not as abundant as its broad range might indicate. It is very thinly scattered on the Sierra Campana north of

(continued on page 79)

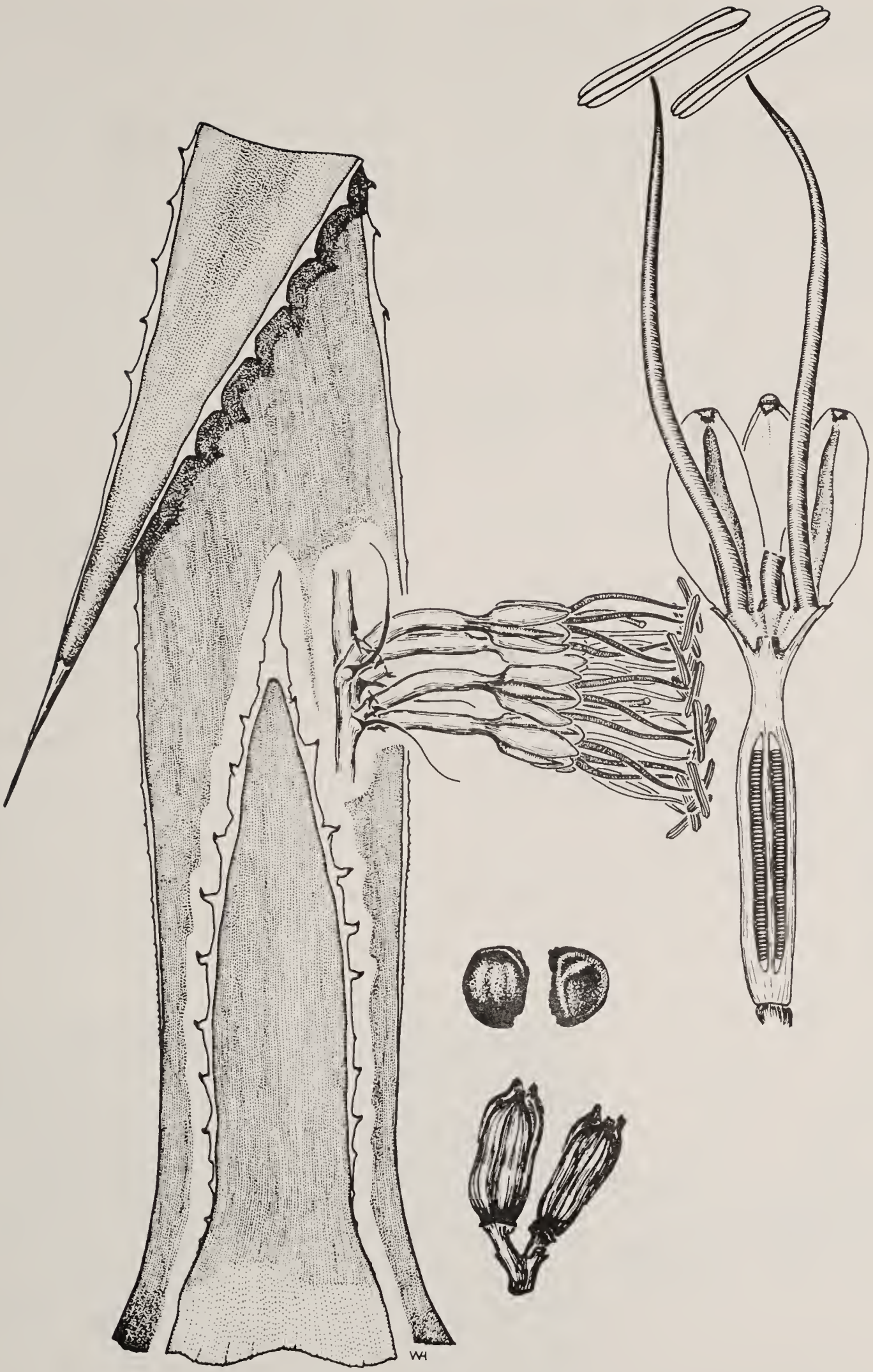


Figure 1. *Agave potrerana*; a long and short leaf, flower cluster, and capsules reduced. Long section of flower and seeds enlarged.

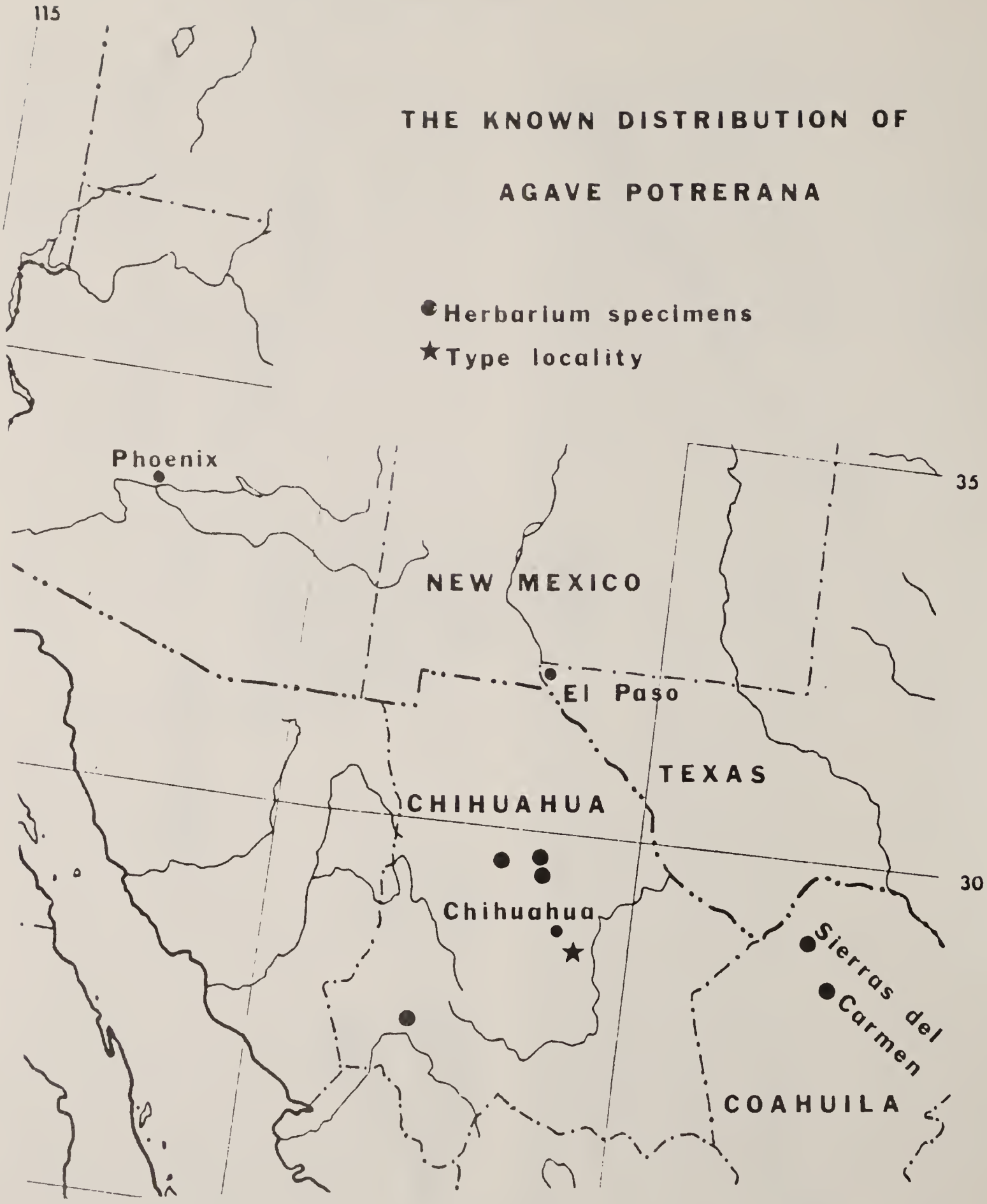


Figure 2. The known natural distribution of *Agave potrerana* in northern Mexico.

Cd. Chihuahua, and appears to have suffered depletion due to cattle overgrazing on the mountain during the past two decades. It is reported as common to abundant on the high elevations of Sierras del Carmen in northern Coahuila (R. H. Wauer and D. H. Riskind collections). We welcome the young plants now established in our Garden.

I first found **Agave potrerana** in 1959 in the Sierra Campana, some with fruiting spikes up to 6-8 m tall, and leaves 40-80 cm long. Seed was sent to the American Horticultural Society, who distributed it to members in 1962. A countryman of Sierra Campana called it "lechuguilla" and stated that its fiber was used locally for rope and cord. In preparing specimens, I found the fiber coarse and strong, of superior appearance to the shorter fiber of its relative, **A. lechuguilla.** In 1961, I sent samples of leaves to the Cotton and Fibers Research Branch of the Agricultural Research Service for testing. D. W. Fishler of the Cordage Fiber Investigations reported:

"The sample of dried leaves of the new agave, found by Dr. Gentry in Mexico, has been retted. We were able to remove most of the encrustants from the fiber.

"The fiber appears to Mr Byrom and me to be somewhat coarser than **A. lecheguilla.** This particular sample is much weaker than sisal or henequen. The weakness, however, might be due to retting."

So, the economic potential of this plant, as fiber, food or medicine remains quite unknown. Until more investigations are made, and even afterwards, we can enjoy the oxygenized air that wafts about our gardens and the ornamental values of this attractive Agave.

LITERATURE CITED

Standley, Paul C. — Trees and Shrubs of Mexico. Contr. U. S. Nat.; Heb. 23, pt. 1. 1920

Davis, Helen B. — Life and Work of Cyrus Guernsey Pringle. Univ. Vermont, Burlington, Vermont. 1936

Dr. Gentry's work on his monograph of the Genus Agave will take him away from the Garden for two months this fall. He will leave in September for the Missouri Botanical Garden and the National Herbarium where he will annotate their extensive collections and review the many type specimens these institutions house.

Earlier this summer, his manuscript of the Agaves of Baja California was accepted for publication — welcome news in the field of botany.

—RGE

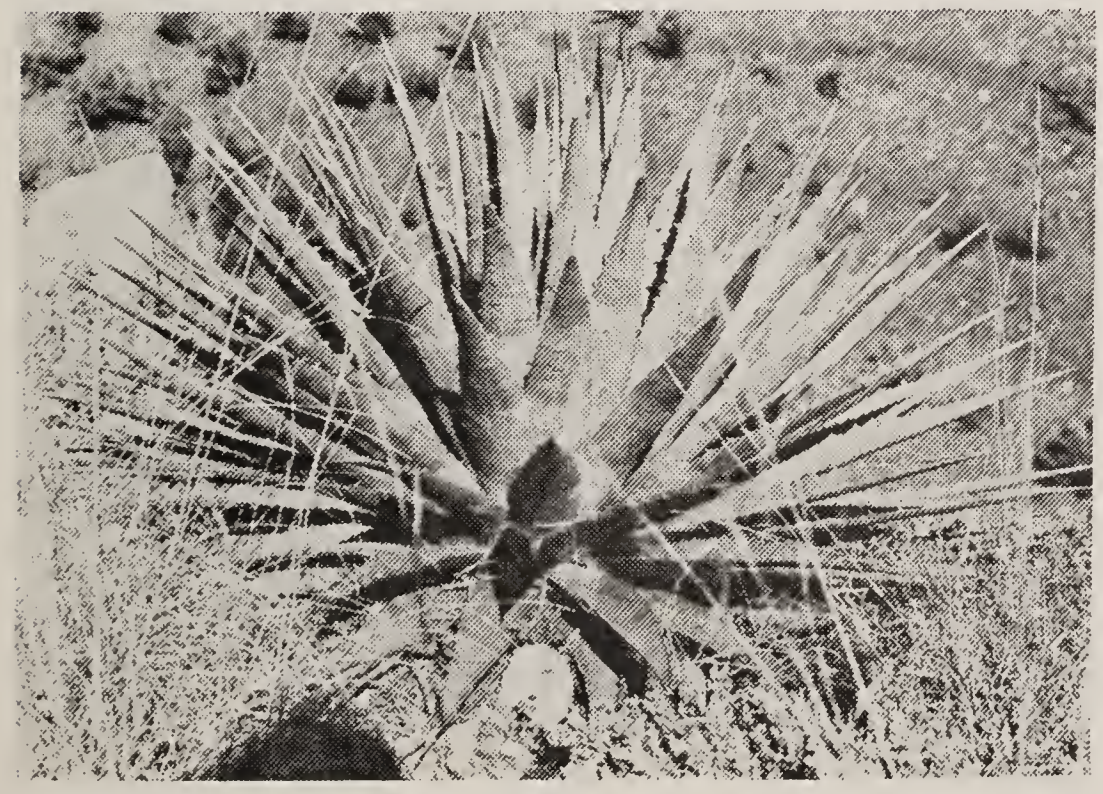


Figure 3. *Agave potrerana* photographed on the Cerro Campana, Chihuahua.

Library Report

In addition to cataloging new books received, and correcting cards dating back some 20 years, we have devoted some time this year to the periodicals section of the library. The library contains 207 different botanical periodicals at present — some running to 15 or more bound volumes — having dropped 61 current periodicals that had only marginal connection with our special needs. Of these 207, we had duplicate copies of some issues and were missing copies of others. Missing issues were acquired, and all periodicals listed and cataloged. Complete issues were bound and duplicate lists prepared. The duplicate periodicals will go to other organizations to fill gaps in their collections. A list of duplicate books was also compiled, with data.

We have acquired a good deal of excellent library furniture and equipment: one oak catalog cabinet on a table stand, with fifteen drawers, allowing for future expansion; 10,000 high quality catalog cards; one 4-drawer vertical file cabinet for pamphlet and ephemeral material, with 100 hanging folders and rods; 2 new typewriters, one oak 8-drawer cabinet for storing flat such items as maps and botanical prints.

The big project for the library at present is to fill the new catalog drawers. We have started making, in addition to the usual author, title, and subject cards, a shelf list card for each book. The shelf list cards will be arranged by classification number so that we can take inventory and always have an accurate check on our holdings. We are going to make more subject cards — this is one area in which the old catalog has been adequate.

A gigantic task being started right now is copying our old catalog cards which are on inferior quality index cards that do not hold up under constant thumbing and handling. (We hope the thumbing and handling will increase as our catalog is put to greater use.) This copying is very tedious and time-consuming but we feel it necessary if the catalog is to be totally efficient. We now have only one volunteer working regularly on this project, but we hope to put at least two more people on it shortly.

Another monumental task is to correlate the Richter pamphlet material with the material in the library's old separata file and material already classified by subject and stored in boxes. Peg Gill, our former librarian who served so long, faithfully, and well, has volunteered to help sort and classify, and we are grateful for her expertise.

Volunteers Dorothy Carson, who has helped four years or more, and Virginia Spangler, who has been with us about two years, continue to provide cheerful and efficient help with cataloging, typing, shelving, filing, covering and mending books, and generally keeping things spruced up.

Early in the year some of the books not essential to a botanical research library were weeded out to relieve the tightly packed situation on the shelves and make room for more essential items. These less-technical books will be put in a separate Lending Library and can be circulated to Garden Members. This, of course, will involve another bookcase and a checking-out system, and another volunteer to take charge of details.

Our aim is to get the library running smoothly and efficiently so it can serve the needs of more researchers and Members. The ideal would be to have enough staff or volunteers to keep the library open at least part of the day Monday through Saturday.

A basic need in the library is a special case for our many rare books, which can be locked and humidified for safety and preservation. We are all seriously concerned with the need for proper care of the Garden's exceptional library.

Elizabeth Fritz
Librarian

Desert Ghost Flower, *Mohavea confertiflora*

Of the plants seen during a Garden trip in western Arizona last spring, the Ghost Flower, **Mohavea confertiflora**, stands out for the same peculiarities that have given it its English name.

It is a pale flower, not quite white but not quite cream-colored, it moves in the slightest breeze, the corolla is strikingly large and fragile-looking, but most of all it looks out of place — "wrong" for the harsh desert habitat, the coarse alluvial gravel where it grows. Ghost Flower seems an appropriate name for this odd-looking plant.

Mohavea confertiflora was first found along the Mohave River in California's Mohave Desert, somewhere near the present town of Barstow, and first described in Vol. IV of the Pacific Railroad Survey, published in 1856.

(This is not the place to go into details about that fascinating publication whose complete title is "Reports of Explorations and Surveys to Ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean in 1853-4", but you may look at it in our library if you promise to handle it gently. The opportunity to look at and handle books like this is not the least of the "fringe benefits" of Garden membership, we think.)

The Ghost Flower is an annual, about twelve inches tall, with very sticky lanceolate leaves, up to two and a half inches long, that are usually coated with windblown sand.

The flowers, an inch to an inch and a half long, are in dense leafy spikes, profuse for a plant this size. Their shape is peculiar, a short tube broadening abruptly into two fan-shaped lips. A bulge at the base of one lip nearly closes the tube. The bulge is called a palate, a good enough term, I suppose, since it is located between the lips and the throat of the flower. The whole structure has a slight resemblance to the familiar shape of a snapdragon flower, which is understandable, since both plants are in the same plant family, the Scrophulariaceae.

If the shape is unusual, so is the color pattern. Both lips are pencilled with fine red-purple dots in nearly vertical lines. There are also large splotches of the same color on either side of the palate. These precise markings have a stylish look, even in dried herbarium specimens.

Mohavea confertiflora is found on rocky desert slopes at elevations under 3000 feet from southeast Nevada to southwest California and western Arizona, south to Baja California, Mexico. In Arizona, it grows only in Mohave and Yuma counties. The plants photographed here were found near Planet Peak in northern Yuma County, near the Bill Williams River and northeast of the town of Parker.

REFERENCES
Jaeger, Desert Wild Flowers
Kearny & Peebles, Arizona Flora
Shreve & Wiggins, Veg. and Flora of the Sonoran Desert
Pacific Railroad Survey

—LD

News & Notes

(continued from page 75)

The enthusiasm of the Board and the staff has been growing during preparations for this very special event, and the Members' Preview will be an evening when we can share out pleasure with you.

Concurrent with the opening of the Botanical Art show, the Garden will also introduce for sale much-requested posters of our Garden logo and a faithful reproduction of one of the handsomest of our antique prints — an **Agave americana** dated 1758.

A long-sought goal of the Garden has been the elimination of sales taxes on items purchased in our bookshop. This has now been accomplished through the combined efforts of Jan Moats, our bookkeeper, and Carolyn Hoppin, our public relations chairman. This development will eliminate much paperwork for the office staff, and we are sure it will please Members and visitors alike.

The paving of the patio recently received a push toward reality by the contribution of over $100 from Margaret Caldwell and her family. For some time the Caldwells have collected and recycled aluminum cans from the Garden and elsewhere, and donated the proceeds to the Garden.

The number of empty soft-drink cans from our vending machines is considerable at any time. Now the volume generated by the summer weather will soon make it necessary to build a bin for temporary storage until they can be recycled. Assistance in this project will be welcome.

The Garden wishes to extend special thanks to Dean Overman of the Arizona State University College of Business Administration. In the past year professors and students of the Business Administration College have helped the Garden by constructing marketing surveys and advertising models which have been incorporated into our existing programs. This concept of applying theory to practical problems is a refreshing and valuable use of student enthusiasm and energy.

FIELD TRIPS

We have made some changes to improve our field trip schedule this year. The most important is that we are planning two trips per month. One is strictly for Garden Members and their guests (we think these are the best trips), the other is open to everyone.

We are trying a new reservations system this year — none will be accepted more than three weeks in advance. It was felt that the trips were too often booked so far in advance by the same people that new members and others didn't have a chance to attend. It's not that we don't like all of you regulars — we're just trying to be fair. Cost is still $1.00 for Garden Members and $2.00 for non-members.

As you saw in the Calendar of Events mailed to you last month, most Members-only trips are to new areas. We'll give details in the next issue of the BULLETIN.

—SCK

An Invitation from Sherry Krummen

Dear Garden Members,

As Education Director, I have tried to give guided tours of the Garden to the groups requesting them, but requests for tours now far exceed the time available — it's much more than a one-person job.

In other botanical gardens, the most popular and successful solution is an organized Docent or Tour Guide Program. Docents are trained volunteer guides who can put the Garden on a more personal level for visitors.

We need to call on our Members as volunteers to help guide the many adult groups and approximately 8,000 school children who visit the Garden during the year. Group visits should become even more frequent, because we have invited the Convention and Visitors Bureau to consider us as the site of tours in the convention activity schedules planned for the coming year.

The Garden will begin its Docent Program this fall, and I'd like to invite you to be a charter member of our Docents. All Garden Docents will have an initial Information Class of six weekly two-hour sessions. It will cover desert plants, their names, characteristics and uses; Garden history and activities; group leading techniques and common questions. Enrollment in the class is free. After initial training, there'll be monthly meetings to keep up with changing Garden displays. From time to time we'll arrange special speakers for you, and for your pleasure and information, we've arranged for Docents to attend most of the Garden classes and workshops they wish without charge.

Docents must be Garden Members. After the class is completed, you will be asked to continue as a Docent for at least two years. You will guide tour groups on a flexible schedule calling for sixteen hours a month of your time from September through May. This will mean only one half-day's guide duties each week, either morning or afternoon, and entailing usually one tour each time, though in emergencies we may need you to take two groups through the Garden.

Our first Docent Information Class will begin the second week of October. If you're interested, please mail me the coupon or give me a call and let me know which one of the possible times is most convenient. Unless you all want to join, only one series of classes will be given this fall, but I'd like to set it for a time that will please the majority.

This is a worthy — and rewarding — volunteer project. I hope that you will join.

SHERRY C. KRUMMEN

NAME _____

ADDRESS _____

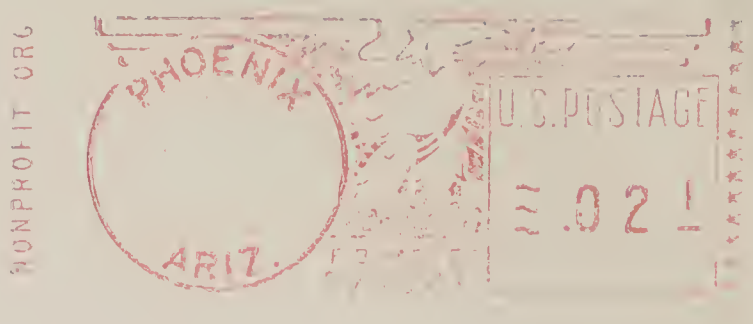
_____

PHONE _____

Class time you prefer:

- ☐ Monday, 2 p.m.
- ☐ Thursday, 9 a.m.
- ☐ Wednesday, 7 p.m.

DESERT BOTANICAL GARDEN



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P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

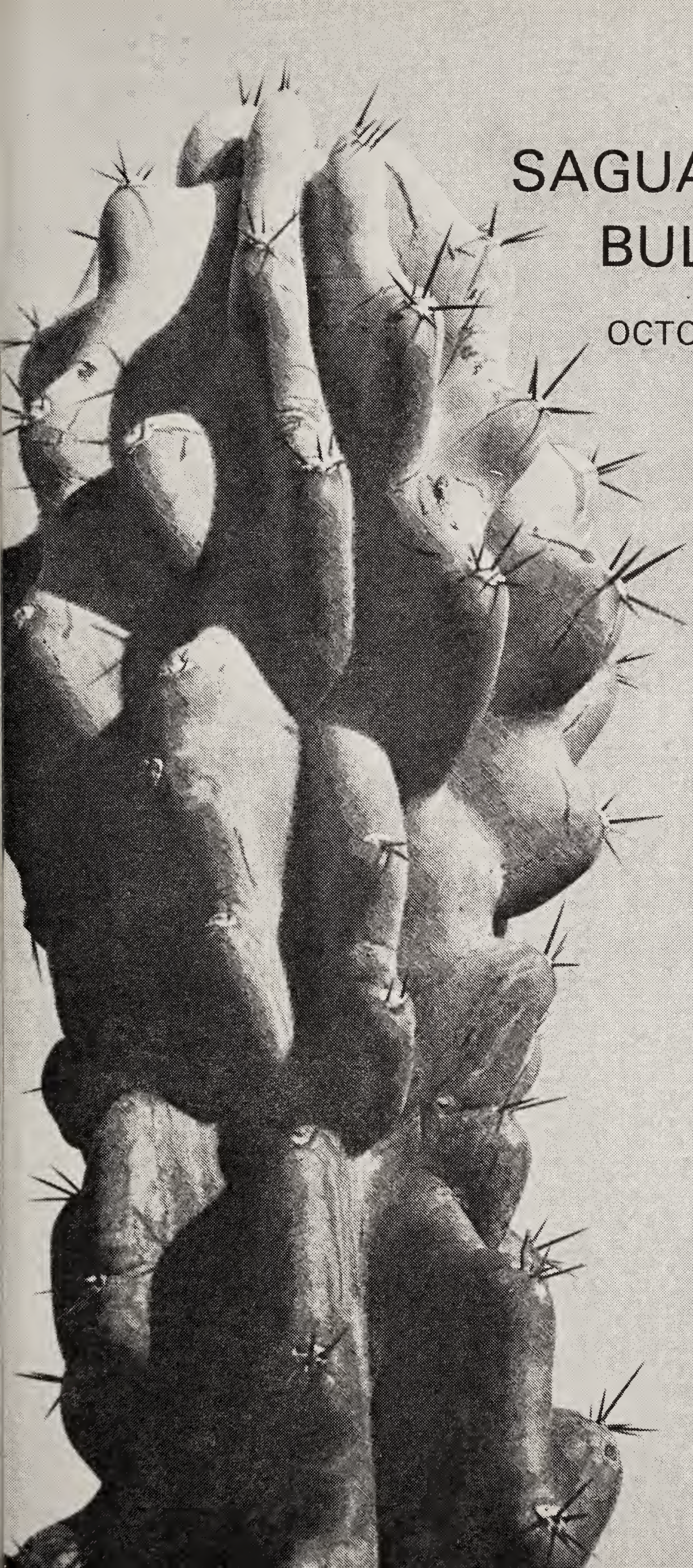
AUGUST

24-Sept. 28	CLASS — POISONOUS & EDIBLE PLANTS. Learn identification of both types, their properties and uses. 6 Wednesday sessions include two field trips. Fees, including books: Members $10.00, non-members $15.00.	**2 p.m.**
25-Sept. 24	CLASS — POISONOUS & EDIBLE PLANTS. (See above) 5 Thursday evening sessions plus weekend daytime field trip.	**7 p.m.**

SEPTEMBER

9	Members' preview of the BOTANICAL PRINT SHOW	**7-9 p.m.**
10-Oct. 23	BOTANICAL PRINT SHOW — An exhibit of botanical art from the 17th to the 20th Century, from the Garden's collection of important and representative European and American works.	**9 a.m.-5 p.m.**
22-Oct. 13	CLASS — PLANT DRAWING FOR BEGINNERS. An outdoor class in how to look at and draw desert plants. 4 Thursday sessions. Fees, including basic materials: Members $5.00, non-members $7.00.	**9:30 a.m.**

The Garden is open every day of the year. Telephone 947-2800 or 946-9942 for information.



SAGUAROLAND BULLETIN

OCTOBER, 1977

SAGUAROLAND BULLETIN Editor, Lillian Diven

OCTOBER, 1977 Vol. XXXI No. 8

DESERT BOTANICAL GARDEN

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News & Notes

There are over 6,000 feet of paths in the Garden. Those in the original public area were paved many years ago, but as new areas were opened to visitors not all paths were surfaced. To pave all the newer paths and repave the deteriorating existing paths and parking lots became a first-priority project, since the safety and convenience of Garden visitors was concerned. Last month the Garden completed the project. All paths and parking lots were sealed and all previously unpaved paths were paved.

In addition to greater safety, the new paths provide improved access for visitors and maintenance personnel, the old paths no longer have cracks, and all areas of the Garden are now accessible to patrons in wheelchairs.

* * *

For some time the Garden has needed an experienced full-time plant propagator, as demands on other personnel allowed them inadequate time for the work. In August Victor Gass was hired in this capacity. He has six years of experience at Mountain States Wholesale Nursery, the last two as head propagator. He is a specialist in propagating many of Arizona's native ornamentals, particularly plants of the arid areas. We welcome this able new member of the staff.

* * *

On September ninth, many Members and guests attended the opening of the Garden's outstanding display of Botanical Art From 1578 To 1977. The show will continue through October twenty-third, and we urge you not to miss it. There has never before been a similar show in the Southwest.

The Garden is justifiably proud that it can present, from its own collection, an exhibit of this scope, including more than a hundred rare prints, books, original watercolors and drawings that are historically important in addition to being beautiful. We also have on loan from the artists some fine examples of contemporary botanical illustration.

The opening inaugurated the sale of large posters of the Garden's Agave logo, for which we have had a considerable number of requests during the last year. It also introduced to our members and guests the first reproduction in a series of old botanical prints planned by the Garden. From the Garden's collection we chose for our first reproduction a 1758 colored

(continued on page 95)

Neolloydia johnsonii (Parry) L. Benson

Neolloydia johnsonii (Parry) L. Benson is relatively well known, but seldom seen in the wild, since it grows in regions that are both inhospitable and unpopulated. It is variously known as the Pineapple or Miniature Barrel Cactus. It is distributed on south slopes near the crests of rocky, nearly barren, outcrops from southern Utah and Nevada south to Death Valley in California and western Arizona in the Mojave Desert. It grows at elevations between 1700 and 4000 feet. The nearest location to Phoenix is in southwestern Yavapai County and in northern and western Yuma County, where the accompanying photographs were taken.

Flowering of **Neolloydia johnsonii** occurs from late March through April. The flowers are from two to three inches in diameter, and develop near the apex. They are either chartreuse (**N. johnsonii** var. **lutescens** W. T. Marshall) or magenta, both colors being about equally common. This flower color variability is a common occurrence among cacti.

Fig. 1. *N. johnsonii* var. *lutescens* photographed in Yuma County.

Fig. 2. Seedling among remaining spines of a decayed parent plant.

Spine color is yellow or pink, both types being found mixed in a population. In either case, the dense spines almost always obscure the stem. Central spines vary from 4 to 8 per areole, and radials from 9 to 10 per areole. The spines are about one inch long, straight, inflexible, and not very pungent as cactus spines go. These plants can be handled without gloves or tongs if one is careful not to use too much pressure.

Fruits are oval to cylindrical and have a few scattered scales. On ripening, the fruit turns tan. Dehiscence is by a single dorsal split. Seeds are black and one-twelfth of an inch long.

The stem of **N. johnsonii** is single and normally conical to ovoid. Occasionally, branched or multiheaded specimens are found. These probably result from mechanical injury. Stems up to ten inches tall and four inches in diameter are known, although the average height is from four to six inches, and diameter is two to four inches.

Five mature plants with three-inch flowers may be picked out in the habitat photo (Fig. 3) by careful search. What is

not revealed is the presence of many seedlings growing in the degrading outcrop.

Figure 2 shows a seedling about one inch in diameter growing in the spiny debris left behind when a parent plant died. It is well known that many of the clumping and smaller single-stemmed cacti provide shade and protection from predators for seeds which fall within the protective radius of their spines. This is especially common among **Echinocereus engelmanni** in our area. A search beneath the decaying remains of a Hedgehog Cactus clump frequently turns up one or more seedlings of the same or even different species.

Cultivation of this plant requires perfect drainage and intense light, with little summer watering.

Harry Johnson reported in 1960 that this cactus "is a very difficult subject, and few collected plants last long under greenhouse or garden conditions. I have grown them with some success in a very gritty granite with some leafmold and silt, no lime. Very little water. It has a wide distribution, seeming to favor locations where summer temperatures are high and winter temperatures often low."

I can only echo Mr. Johnson's comments, as his experience seems identical to my own. I might also note that the pretty pink spines tend to turn gray in specimens cultivated in the Phoenix area, perhaps as the result of salt accumulations from overhead watering with our notoriously hard water.

For an account of nomenclature, see Benson.

REFERENCES

Benson, Cacti of Arizona, Third Edition, 1974

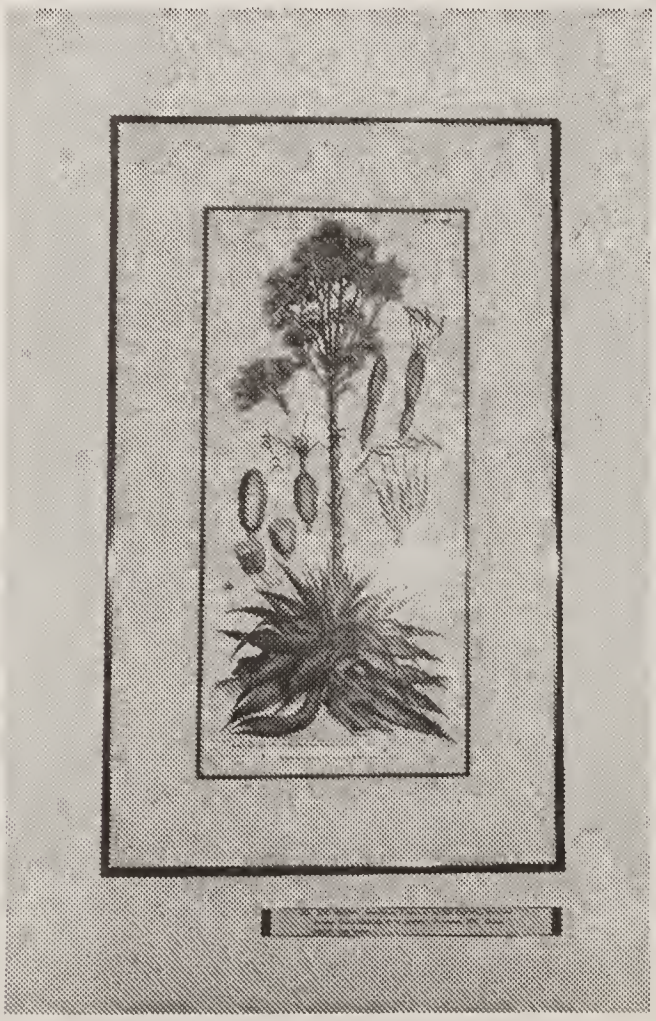
Johnson, in Cactus & Succulent Journal, Vol. XXXII, p. 19

—RGE

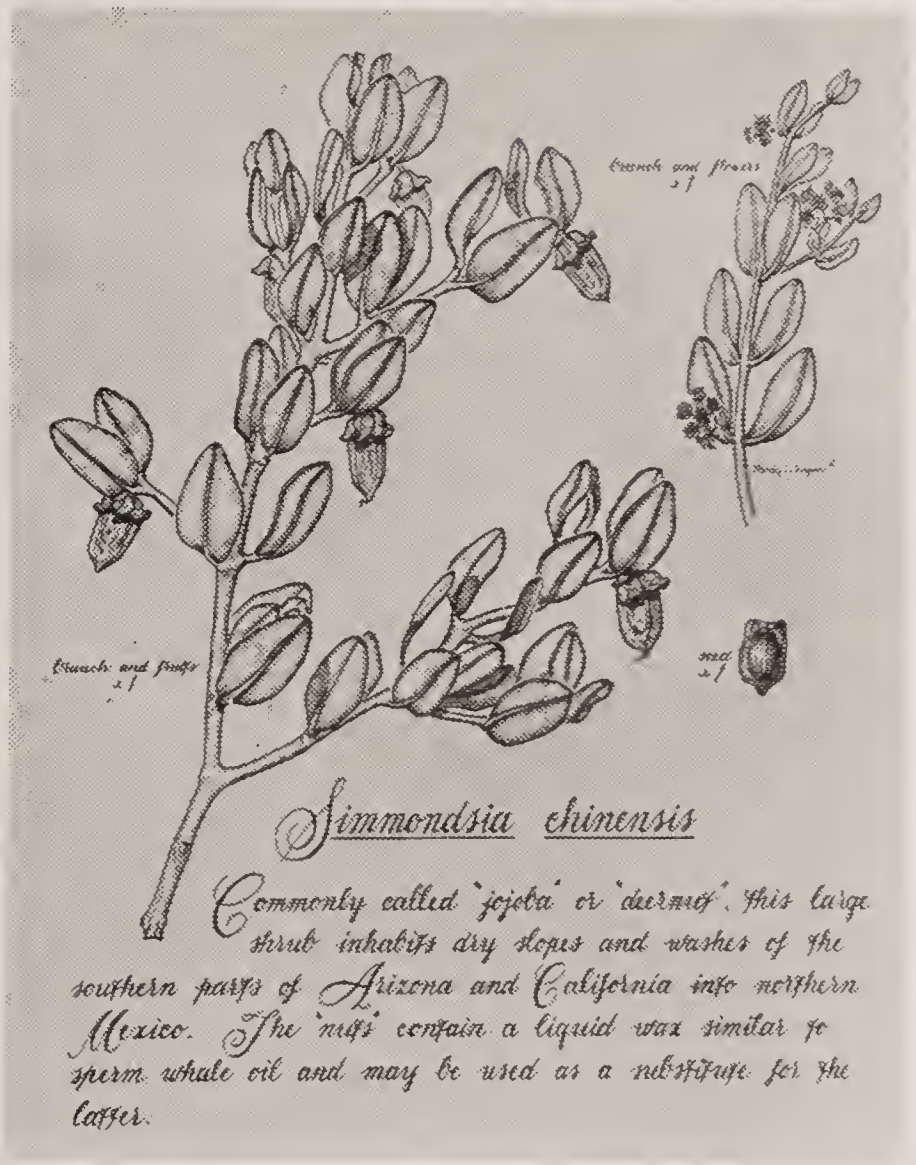
Fig. 3. Habitat photo of *N. johnsonii* taken in the Rawhide Mountains of Yuma County, Arizona, in April, 1977.

BOTANICAL PRINT SHOW OPENING

The preview on the evening of September 13th for our Members and guests opened a six-week exhibition of old and modern botanical illustrations and rare books from the Garden's library and print collection, and prints and drawings on loan from contemporary artists. Above left, Board Member Dr. Charles Merbs and botanical artist Wendy Hodgson in front of her Arizona Flora Suite. Below left, our newly-published reproduction of a 1758 print of **Agave americana**, framed by Gallery 3, who also mounted the unframed prints for the show. Below right, Sherry Krummen and Lynn Bieschke with our new Garden poster.



Photos: Fred Adrian


Simmondsia chinensis
Commonly called 'jojoba' or 'deernut', this large shrub inhabits dry slopes and washes of the southern parts of Arizona and California into northern Mexico. The 'nuts' contain a liquid wax similar to sperm whale oil and may be used as a substitute for the latter.

More than a hundred works from our valuable collection were selected and mounted — dating from 1734 hand-colored prints and a 1795 watercolor, through etchings by Ehret and Redoute, to original drawings for "The Cactaceae" in this century. Next to a number of prints, living specimens of the same plant served better than words to emphasize the botanical accuracy required from the artists who must combine scientific precision with their technical skills.

In the photo top left, three of the Board members attending the preview, Naomi Kitchel, Vice President Edward Burrall and President Mildred F. May. Top right, Colleen Maloy and Garden Members Bill and Betty Cramer. Above, the Jojoba print from Wendy Hodgson's eight-drawing portfolio. The fine detailing in the original large print is unfortunately lost in this small photograph.

INFORMATION SOURCES FOR DESERT GARDENERS

by Russell Haughey, Garden Horticulturist

When someone calls us to ask why his saguaro is turning brown, the first thing we ask is "How do you water it?" Quite often the answer is "The man at the nursery told me to spray it down every day when the weather gets hot, to cool the saguaro off."

Now, I'm sure that the Garden members reading this article know that spraying down a cactus in the midday sun is the worst thing you can do for it — unless you want to have a badly sunburnt plant — and you know that you shouldn't construct a "watering basin" around the cactus when you plant it — but this sort of misinformation is handed out pretty often by "the man at the nursery" to inexperienced desert gardeners.

This is not to say that most nurserymen are ignorant or irresponsible. I know that almost all the established nurserymen in the Valley are very professional, and make sure that their employees pass on only accurate planting advice. When you find a well-informed nurseryman, stick with him. Just the same, there are some less-than-reputable people selling cactus in this area. Your best defense against them is to learn for yourself the basics of desert gardening, and to know where to get information when you need it.

There are other sources of reliable information besides the good nurseries. Here is a list of local organizations that can help you with plant problems.

Boyce-Thompson Southwestern Arboretum, P.O. Box AB, Superior, Ariz. 85273. (High-desert gardeners consult the Arboretum on their specific problems.)

Cooperative Extension Agent, 4341 E. Broadway, Phoenix. Phone 271-4456. Our local equivalent of the "county agent" — this office knows all about crops and garden plants.

Arizona Commission of Agriculture and Horticulture, 1688 W. Adams St., Phoenix. Phone 271-4373. This is the place to go for information about our Native Plant Laws, and about moving protected plants. They might even tell you how you can save a cactus from a bulldozer.

Arizona State Entomologist, L. D. McCorkindale, 1688 W. Adams St., Phoenix. 271-4373. For information about insect pests and what to do about them.

Town & Garden Supply Co., 2222 N. 27th Ave., Phoenix, Ariz. 85009. Phone 278-8585. They publish a quarterly newsletter they will send to any interested gardener free of charge. All you have to do to be put on the mailing list is to give them a call.

The **Central Arizona Cactus & Succulent Society** meets here at the Garden in our Webster Auditorium on the last Sunday of every month at 2 p.m. One of the purposes of this organization is to help people with problems concerning cactus and succulents.

One of the best books I have seen for desert gardeners is "Native Trees and Shrubs for Landscape Use in the Desert Southwest", by Sacamano and Jones. Besides good cultural information it contains photographs of mature plants. It is available at the Garden's bookshop for $1.50 a copy ($1.75 postpaid).

Also available at the bookshop is the Sunset "Western Garden Book" which is a basic book for western gardeners and contains useful information for Arizonans. The price is $5.95 a copy ($6.45 postpaid).

* * *

Gardeners have reported heavier damage to their Agaves from snout beetle infection than ever before. I'd like to remind you of two things you should do to combat the problem. First, remove any infected plant and take it to the dump, so that it won't spread the infection. Second, spread Diazinon granules around the base of healthy Agaves and work the granules into the ground about an inch or two. Repeat weekly during the rest of the hot weather.

A Border Country Wildflower

(The name of this genus is manageable if you don't try to give it a French accent. Pronounce it "am-o-ROOKS-ee-a" and ignore its origin. About plants named for people, Ivimey-Cook has comforting words. "One often is obliged to do the best one can with the letters that are provided.")

Near the Arizona-Mexico border we find the northernmost member of the Cochlospermum or Shellseed Family, which is otherwise a tropical or subtropical family with showy flowers and palmate leaves. **Amoreuxia palmatifida** and **A. gonzalezii**, the only two species of this genus native to Arizona, are low perennial herbs. The one other genus in the family, **Cochlospermum**, contains trees as tall as forty feet.

From a tuberous rootstock, **A. palmatifida** sends up one to several foot-long stems that bear one or more intensely yellow flowers in late summer, and seven-to-nine-lobed palmate leaves on long petioles. The plants are locally abundant on gravelly or heavy alluvial soil in southern Arizona and northern Mexico at 3500-5000 ft. elevations.

The handsome irregular flowers become more interesting the closer you look at them. First to catch the eye are the five large petals, each more than an inch long, with feather-edged spots of dark orange-red on the upper four. The five sepals are narrower and shorter.

The stamens are the next feature that catches and holds your attention. There are two quite distinct sets of them, one set with long, curved filaments and purple anthers, the other with shorter, straight filaments and smaller, yellow anthers. A strong glass is needed to see that the anthers have a peculiar structure — they open by two terminal slits or pores to distribute the pollen.

If you're lucky enough to find **A. palmatifida** in fruit, don't hesitate to taste it. Kearney and Peebles says that the hollow, egg-shaped fruit, one to three inches long, is reported to taste like carrots or parsnips.

If that doesn't tempt you, we have better, firsthand information from Dr. Gentry. He says the fruit is very good. It's flavorful, with a pleasant taste of its own, and it's nice and crisp in salads. Eat it raw or cooked. The roots are also edible, but since they're fibrous it's better to boil or roast them. There's a possible economic future for the plant, Dr. Gentry says, but not until someone comes up with a name for it that has more popular appeal!

It would seem that such an attractive flower would have a future as a garden plant, too, but like most tuberous-rooted plants it can't take the overwatering that most flower beds get. The average gardener would kill it with kindness.

REFERENCES

Ivimay-Cook, Succulents, a Glossary
Kearney & Peebles, Arizona Flora
Shreve & Wiggins, Veg. and Flora of the Sonoran Desert

——LD

The two different sets of stamens are clearly visible in this photo.

1977-78 FIELD TRIPS

Trips will leave the Garden's Auditorium promptly at 8:00 a.m. unless noted. Use the service road and park in back. Bring a lunch that you can carry with you on the hike if it's necessary. Bring water and wear comfortable shoes. Transportation is the responsibility of the participants — car-pooling is encouraged.

The trips this year have been rated according to difficulty. E means an easy trip, no climing, less than a mile of hiking; M means moderate difficulty, little climbing, hiking under 4 miles; D means difficult trip, hike up to 8 miles, some climbing.

Oak Creek Canyon — October 8 - M - Members only. You've probably all been here but have you taken a close look at the plants? It's 115 miles to Sedona, so we'll leave the Garden at 7:00 a.m. Expect some wet hiking. There should be late wildflowers still in bloom.

Seven Springs — October 29 - M - open to public. This favorite picnic area along Camp Creek & north of Carefree is 55 miles from the Garden. We'll be hiking up the stream about a mile, looking for late summer wildflowers. This might be a good spot to look for fall migrant birds.

Four Peaks — November 19 - M - Members only. It's 80 miles out Beeline Highway and up the mountain, over occasionally rough roads. We'll pass through several different life zones from low desert to ponderosa pine at the top. Several miles of hiking are planned.

South Mountain — November 26 - E - open to public. This will be a short, easy trip — only 10 miles from the Garden — especially for those new to desert plants. We'll see and discuss many of the more common native plants.

Horseshoe Dam — December 10 - E - Members only. 45 miles from the garden on the Verde River, northeast of Carefree. We'll see typical upland Sonoran Desert with many saguaros, prickly pears and jojoba, as well as the moisture-loving plants along the river. Short hikes planned.

McDowell Mountain Park — December 17 - E - open to public. This is a lovely desert park about 40 miles from the Garden and doesn't get a lot of use yet. We'll be taking a short hike down a large wash.

First Water (Superstition Mountains) — January 14 - M - Members only. Here we will see a lot of cacti, some low chaparral plants such as scrub-oak and sugar sumac and some of the typical riparian plants along the wash. First Water is about 20 miles from the Garden and we'll hike 4 or 5 miles.

Picacho Peak — January 28 - M - open to public. We're trying this trip again since we had such bad weather last year. It's about 80 miles down I-10. We'll take the easy climb up to the saddle and another across the lower desert.

Tonto Basin — February 11 - E - Members only. We'll probably drive a loop through the basin between the Sierra Anchas and the Mazatzal Mountains — round trip could be 200 miles, so we'll leave at 7:00 a.m. Short easy hike from the cars to see desert grasslands and canyon vegetation.

Hidden Canyon — February 25 - E - open to public. Located between Florence and Forence Junction about 75 miles from the Garden. Expect easy hiking through the canyon to see the specialized plants that can survive the flash floods through the narrow canyon, and early wildflowers.

Peralta Canyon — March 4 - M - open to public. This has always been a favorite Garden field trip. We'll hike several miles up the canyon. This should be a good time to see spring wildflowers. The canyon is about 30 miles from the Garden.

Cherry Creek — March 25 - D - Members only. This will be a long trip — about 200 miles total — with quite a bit of difficult

hiking and climbing over boulders. The area is beautiful, though, with large trees, redbud, columbine and maybe poison ivy. We'll leave the Garden at 7:00 a.m.

Wickenburg — Joshua Tree Parkway — April 8 - E - Members only. Another long trip — it's about 90 miles from the Garden — so we'll leave at 7:00 a.m. Short hikes to see the Joshua trees, also crucifixion thorn and paper-bag bush.

Humboldt Mountain — April 29 - E - open to public. The driving may be rough on this trip, but we'll take only short hikes. Humboldt Mountain is 55 miles from the Garden in high desert-chaparral type vegetation.

Sierra Anchas — May 13 - M - members only. Northeast of Roosevelt Dam, the Sierra Anchas are about 120 miles from the Garden. We'll leave at 7:00 a.m. and stop at Parker Creek in chaparral vegetation and Workman Creek Falls in ponderosa pine.

Sycamore Creek — May 27 - E - open to public. We'll probably hike up the creek in the Mesquite Wash area (about 40 miles up the Beeline Highway). There's a seep here that supports a bank of monkey flowers and columbine as well as larger walnuts, mulberrys and barberrys.

Naturally, we have scouted out all of the planned field trip sites, and we expect to visit them again just before the field trip date in order to make sure of road conditions. We'll also have check lists of the area's plants for field trip participants.

News & Notes

(continued from page 87)

print of the Century Plant, **Agave americana.** It is reproduced in a limited edition on quality paper similar to that of the original, and is identical in size and color.

The Garden also introduced the botanical art of Wendy Hodgson in her first "Arizona Flora Suite", a limited edition of eight fine drawings of desert plants: the saguaro, prickly pear, ocotillo, jojoba, sacred datura, palo verdes, mesquites, and agave. Only one hundred of these elegant portfolios will ever be available.

* * *

As most Members know, the Garden is one of the institutions that participate in operations involving confiscated and salvaged desert plants. During the past month, the staff, in addition to their many regular duties, brought to the Garden several hundred plants, some quite rare, from the Central Arizona Project right of way, a quarry operation, and a proposed mine tailings site. A job like this means hard work, often at an inconvenient time, but it is an important one. Our participation not only helps us in achieving the Garden's goals, but promotes further interest and cooperation on the parts of government and private concerns.

* * *

August saw the first summer field trip scheduled by the Garden. It was also our first overnight trip, and was a success. All of the participants survived the eleven-mile hike through Aravaipa Canyon, though relatively few were heard to say "Let's keep going" at the end of the day.

* * *

A reminder: it is essential to sign up early for the upcoming classes. There has been increased interest in the Garden's classes, and they are almost always completely filled weeks in advance. Check the Calendar of Events for Fall classes you might be interested in taking.

Members' Prices

The Hodgson portfolio of eight drawings is priced at $100. Members of the Garden pay $75.00.

Prices for the 22x34 in. Agave poster and the 18x23 in. botanical print reproduction are $3.00 and $10.00 respectively. Your Member's Discount makes them $2.70 and $9.00.

DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

OCTOBER

to Oct. 23	Continuation of BOTANICAL PRINT SHOW	9 a.m.-5 p.m.
4	CACTOMANIACS — Potluck supper & business meeting	6:30 p.m.
8	MEMBERS' FIELD TRIP — OAK CREEK CANYON (Type: M) Fees: Members $1.00, guests $2.00	7 a.m.
11-25	CLASS — WILDFLOWERS. A beginners' course in learning and growing Arizona's desert wildflowers. 3 Tuesday sessions. Fees, including books and seeds: Members $5.00, non-members $7.00	2 p.m.
12 to Nov. 9	CLASS — PRACTICAL DESERT GARDENING. Choosing, planting and caring for low-water, low-maintenance ornamentals. 5 Wednesday sessions. Fees, including plants: Members $10.00, non-members $15.00	6 p.m.
12 to Nov. 16	CLASS — WHAT IS A DESERT? An introduction to deserts, desert plant life, desert landscaping. 5 Wednesday sessions plus 1 field trip. Fees, including books: Members $7.50, non-members $15.00	2 p.m.
13 to Nov. 20	CLASS — WHAT IS A DESERT? (See above) 5 Thursday evening sessions plus a Sunday field trip	7 p.m.
29	FIELD TRIP (Open to public) — SEVEN SPRINGS (Type: E) Fees: Members $1.00, non-members $2.00	8 p.m.

NOVEMBER

3, 10, 17	FREE PUBLIC LECTURES	3 p.m.
2	CACTOMANIACS	8 p.m.
19	MEMBERS' FIELD TRIP — FOUR PEAKS (Type: M) Fees: Members, $1.00, guests $2.00	8 a.m.
23	Members' Preview of the "SPIRIT OF THE DESERT" ART SHOW	7-9 p.m.
24 to Dec. 4	"SPIRIT OF THE DESERT" ART SHOW — Paintings in oil, watercolor, other media by Arizona artists. A juried show	9 a.m.-5 p.m.
26	FIELD TRIP (Open to public) — South Mountain Park (Type: E) Fees: Members $1.00, non-members $2.00	8 a.m.

The Garden is open from 9 a.m. to sunset every day of the year. For information, telephone 947-2800 or 946-9942.

Desert Botanical Garden

Calendar of Events Winter-Spring 1978

Papago Park,
Phoenix, Arizona
access via 58th St.
and Van Buren St.
or 64th St. and McDowell Rd.
open every day of the year
9 a.m. to sunset

A Non-Profit Incorporated Educational Society
for the Study of Desert Plants

DESERT BOTANICAL GARDEN
Calendar of Events for Winter & Spring 1978

The Desert Botanical Garden is open to the public every day of the year 9 a.m. to sunset. Admission to the Garden is $1.00 for adults, 50c for children from five to fifteen, no charge for children under five.

CLASSES & WORKSHOPS: Daytime and evening classes and workshops of one to six weeks duration are held during the year. Fees vary, and are listed in this calendar. Reservations are required since enrollment is limited.

FIELD TRIPS: The Garden schedules two field trips every month, one for Garden Members and their guests only, and one that is also open to the public. Prepaid reservations are required, but no reservations will be accepted more than three weeks in advance of the trip. Meet in the Garden's Webster Auditorium (take the service road). Departure promptly at 8 a.m., or earlier where noted in this calendar. Participants travel in their own cars — car-pooling is encouraged.

The field trips have been rated according to difficulty. E means an easy trip, no climbing, less than a mile of hiking; M means moderate difficulty, little climbing, hiking under four miles; D means a difficult trip, hike up to 8 miles, some climbing. Leaders are familiar with trip sites and will have the authority to disqualify persons unlikely to make the trip in safety.

Wear comfortable, suitable shoes (lug soles recommended), bring water and a lunch that can be carried with you on the hike.

Note: From time to time additional classes, workshops and field trips may be arranged on short notice. If you wish to be placed on our mailing list for information about any of these, telephone the Garden at 947-2800.

[redacted] PUBLIC LECTURES are scheduled on most Thursdays in the Garden's Webster Auditorium at 3 p.m., November through April.

CACTOMANIACS, an informal group interested in desert plants and related subjects, meets on the first Tuesday of the month, October through May. Visitors are welcome.

The CENTRAL ARIZONA CACTUS & SUCCULENT SOCIETY, an affiliate of the national society, meets in the Garden at 2 p.m. on the last Sunday of each month during the entire year, except when outside events are planned. Visitors are invited to meetings, but should telephone the Garden to check the CAC&SS schedule.

For further information on any Garden event, telephone 947-2800.

DECEMBER

to Dec. 4	Continuation of "SPIRIT OF THE DESERT" ART SHOW. 9 a.m.-5 p.m.
8, 15, 22, 29	[redacted] PUBLIC LECTURES. 3 p.m.
6	CACTOMANIACS. 8 p.m.

8	WORKSHOP — DESERT CHRISTMAS DECORATIONS. Ideas and techniques using native materials. 1 Thursday session (bring lunch). Fees, including some materials: Members $5.00, non-members $7.00. 9:30 a.m.-2 p.m.
10	MEMBERS' FIELD TRIP — HORSESHOE DAM (Type: E) Fees: Members $1.00, guests $2.00. 8 a.m.
13-	CLASS — FIELD IDENTIFICATION. An intermediate course in desert plant identification. 6 Tuesday sessions. Fees including books and hand lens: Members $10.00, non-members $13.00. 2 p.m.
15	WORKSHOP — DESERT CHRISTMAS DECORATIONS (Repeat of Dec. 8 workshop. See above). 9:30 a.m.-2 p.m.
17	FIELD TRIP (open to public) — McDOWELL MOUNTAINS (Type: E) Fees: Members $1.00, non-members, $2.00. 8 a.m.

JANUARY

5, 12, 19	[redacted] PUBLIC LECTURES. 3 p.m.
3	CACTOMANIACS. 8 p.m.
4	CLASS—HOUSE PLANTS FOR PHOENIX. Choosing and caring for indoor plants. 4 Wednesday sessions includes one trip to wholesale grower. Fees, including book: Members $10.00, non-members $12.00. 2 p.m.
14	MEMBERS' FIELD TRIP — FIRST WATER, SUPERSTITION MTS. (Type: M) Fees: Members $1.00, guests $2.00. 8 a.m.
21	WORKSHOP—PRUNING. Techniques and tools for keeping trees and shrubs looking their best. 1 Saturday session. Fees, including book: Members $5.00, non-members $6.50. 9 a.m.-noon
27	Members' Preview of the PHOTOGRAPHY SHOW. 7-9 p.m.
28	ANNUAL PHOTOGRAPHY SHOW. Theme — DESERTS OF THE WORLD. A juried show. January 28 through February 5. 9 a.m.-5 p.m.
28	FIELD TRIP (open to public) — PICACHO PEAK (Type: M) Fees: Members $1.00, non-members $2.00. 8 a.m.

FEBRUARY

to Feb. 5	Continuation of PHOTOGRAPHY SHOW. 9 a.m.-5 p.m.
9, 16, 23	[redacted] PUBLIC LECTURES. 3 p.m.
7	CACTOMANIACS. 8 p.m.
9 and 11	WORKSHOP—PROPAGATION. Learn to start new plants from seeds and cuttings. 1 Thursday evening session and 1 Saturday session. Fees, including seeds and cuttings: Members $7.50, non-members $10.00. Thursday 6:30 p.m., Saturday 10-12 a.m.
11	MEMBERS' FIELD TRIP — TONTO BASIN. (Type: E) Fees: Members $1.00, guests $2.00. 8 a.m.
15	WORKSHOP — TERRARIUMS AND DISH GARDENS Learn to design and maintain miniature gardens. 1 Wednesday session — bring a sack lunch. Fees, including all materials for 1 terrarium and 1 dish garden: Members $17.00, non-members $20.00. 9:30 a.m.-2 p.m.
16 and 18	WORKSHOP — PROPAGATION. (Repeat of Feb. 9 workshop. See above). Thursday 6:30 p.m., Saturday 10-12 a.m.

19-25 CHALLENGE OF THE ENVIRONMENT EXHIBIT by Girl Scout Cadets. 9 a.m.-5 p.m.

22 WORKSHOP — DRIED FLOWER CRAFTS. A beginners course in learning to preserve plant material and ideas for crafts using these. 2 Wednesday sessions. Fees, including some materials: Members $5.00, non-members $7.50. 2 p.m.

25 FIELD TRIP (open to public) — HIDDEN CANYON (Type: E) Fees: Members $1.00, non-members $2.00. 8 a.m.

MARCH

2, 23, 30 FREE PUBLIC LECTURES 3 p.m.

4 FIELD TRIP (open to public) — PERALTA CANYON (Type: M) Fees: Members $1.00, non-members $2.00. 8 a.m.

12-19 30TH ANNUAL CACTUS SHOW. Exhibits of specimen plants, dish gardens and arrangements. 9 a.m.-5 p.m.

25 MEMBERS' FIELD TRIP — CHERRY CREEK (Type: D) Fees: Members $1.00, guests $2.00. 8 a.m.

28 CLASS — WILDFLOWERS. A beginner's course in learning and growing Arizona's desert wildflowers. 3 Tuesday sessions including field trip. Fees, including book and seeds: Members $7.00, non-members $10.00. 2 p.m.

29 CLASS — WHAT IS A DESERT? An introduction to deserts, desert plant life, desert landscaping. 5 Wednesday sessions plus 1 field trip. Fees, including book: Members $12.00, non- members $15.00. 2 p.m.

APRIL

6, 20, 27 FREE PUBLIC LECTURES. 3 p.m.

3 WORKSHOP — DYEING WITH DESERT PLANTS Learn which are good dye plants, process them, dye different fibers. 4 Monday sessions. Fees: Members $12.00, non-members $15.00. 6:30 p.m.

4 CACTOMANIACS. 8 p.m.

8 MEMBERS' FIELD TRIP — WICKENBURG. (Type: E) Fees: Members $1.00, guests $2.00. 8 a.m.

14 Members Preview of ANNUAL SALE OF UNUSUAL PLANTS. 4 p.m.-Sunset

15-16 ANNUAL SALE OF UNUSUAL PLANTS FOR DESERT GARDENS. Hard-to-find and newly introduced trees and shrubs, cacti and other succulent plants. 9 a.m.-5 p.m.

18 CLASS—PRACTICAL DESERT GARDENING. Choosing, planting and caring for low-water, low-maintenance ornamentals. 4 Tuesday sessions. Fees, including book and plants: Members $12.00, non-members $15.00. 6 p.m.

20 CLASS — PLANT DRAWING FOR BEGINNERS. An outdoor class in how to look at and draw desert plants. 4 Thursday sessions. Fees, including basic materials: Members $7.50, non- members $10.00. 9:30 a.m.

20 CLASS — POISONOUS AND EDIBLE PLANTS. Learn identification of both types, their properties and uses. 3 Thursday evening sessions, plus 2 Saturday field trips. 7 p.m.

29 FIELD TRIP (open to public) — HUMBOLDT MOUNTAIN (Type: E) Fees: Members $1.00, non-members $2.00. 8 a.m.

MEMBERSHIP APPLICATION

Desert Botanical Garden
Box 5415, Phoenix, AZ 85010

Enclosed is my check for $_____. I wish to become a Member of the Desert Botanical Garden in the category checked below.

Mr.
Mrs.
Miss_____

Address_____

City_____ State_____ Zip_____

Annual Memberships:

Individual, $15.00	☐	Family, $20.00	☐	Life Membership, $500.00	☐
Sustaining, $50.00	☐	Benefactor, $100.00	☐	Patron Membership, $1,000.00	☐

DESERT
BOTANICAL
GARDEN
P.O. BOX 5415
PHOENIX, AZ. 85010
(602) 947-2800

MAY

2 CACTOMANICAS — Potluck Supper. 6:30 p.m.

3 CLASS — FIELD IDENTIFICATION. An intermediate course in desert plant identification. 5 Wednesday sessions, plus 1 Saturday field trip. Fees, including books and hand lens: Members $10.00, non-members $13.00. 6 p.m.

5 WORKSHOP — TERRARIUMS AND DISH GARDENS. (Repeat of February 15 Workshop. See above). 9:30 a.m.-2 p.m.

13 MEMBERS' FIELD TRIP — SIERRA ANCHAS. (Type: M) Fees: Members $1.00, guests $2.00. 8 a.m.

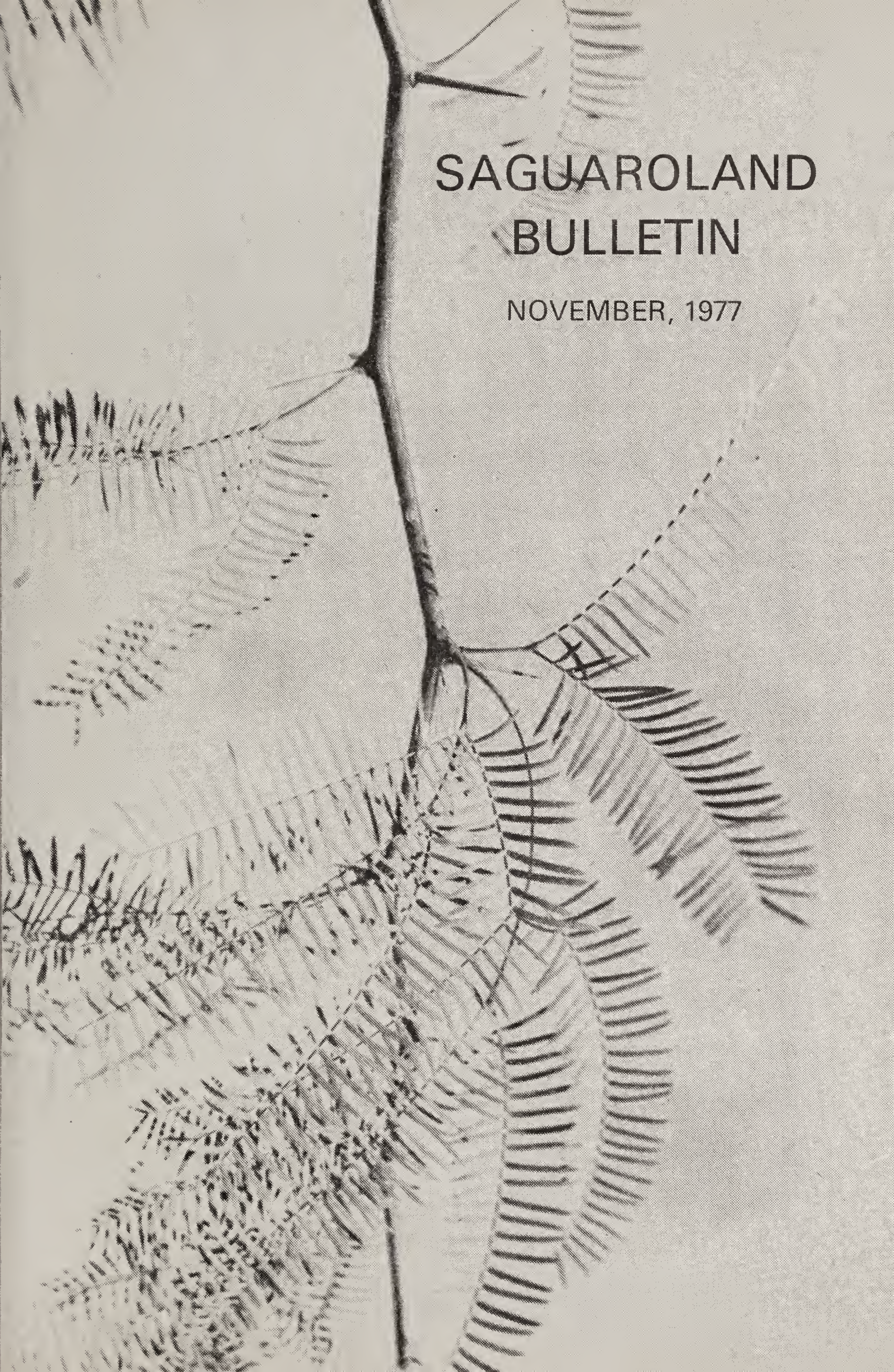
25 WORKSHOP — USEFUL DESERT PLANTS. Learn identification and uses of some dye, fiber, medicinal and other plants. 2 Thursday sessions. Fees, including book and samples: Members $6.00, non- members $8.00. 6:30 p.m.

27 FIELD TRIP (open to public) — SYCAMORE CREEK (Type: E) Fees: Members $1.00, non-members $2.00. 8 a.m.

IN ADDITION — classes, workshops, field trips, lectures. Several of the day and evening classes will be repeated, and new ones will be introduced.

(The Summer-Fall Calendar of Events will appear in early June. For information on any event, telephone 947-2800).

DESERT BOTANICAL GARDEN
PO BOX 5415
PHOENIX, AZ. 85010
(602) 947-2800



SAGUAROLAND BULLETIN

NOVEMBER, 1977

SAGUAROLAND BULLETIN Editor, Lillian Diven

NOVEMBER, 1977 Vol. XXXI No. 9

DESERT BOTANICAL GARDEN

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Cover: *Prosopis alba,* a Mesquite from southern South America

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ANNUAL MEMBERSHIP
Individual . . . . . $ 15.00
Family . . . . . $ 20.00
Sustaining . . . . . $ 50.00
Benefactor $100.00
Elementary or
High School . . . . . $ 3.00.

LIFE MEMBERSHIP
$500.00

PATRON MEMBERSHIP
$1,000.00

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Mrs. Charles Gilliland, Les Mahoney, Eleanor B. Sloan, Advisory Board.

News & Notes

Last month the first Cactomaniacs meeting of the season started with the traditional pot luck supper. Because of the continuing Botanical Print Show, the dinner was held on the patio arcade by candlelight. This year we are seeking a program committee chairman to take charge of arranging for speakers and make the group self-sufficient. A refreshment committee is also being formed. Anyone interested in helping in either of these areas should call the Garden and let us know.

* * *

This month initiates our first "Spirit of the Desert Art Show." It is our first juried "all art" exhibition. In the past an unjuried art show was sponsored each year in conjunction with the Cactus Show. That section of the annual show had grown so fast that it was necessary to limit the number of entries per exhibitor to only 2 paintings. We felt it was time to expand the show. Khrybel Amberg, President of the Scottsdale Artists' League and a long-time Garden volunteer, has taken on the additional job of chairing this show. For additional information and entry forms please contact the Garden.

* * *

Thirty-five people attended the first meeting of the Docent Training Program for Garden volunteers. After the training sessions that will cover the Garden's plants, its history and its work, the qualified docents will act primarily as guides for groups that visit the Garden. Many at the meeting also signed up as volunteers in other areas of Garden activity where their help is needed.

If you couldn't attend that meeting, but would like to learn more about the Docent Training Program, contact Sherry Krummen here. A second training class is scheduled for next spring.

* * *

Members and friends of the Garden wishing to attend our Christmas Decorating Workshop on either December 9th or December 15th would do well to sign up soon. Mrs. Krummen already has what we think is a well-stuffed file of holiday projects, but she's asking Garden Members for more ideas. Phone her at 947-2800 with your suggestiona.

* * *

A meeting in mid-October gave Garden Volunteers a plea-

(continued on page 103)

FERTILIZING DESERT SOILS

by Russell Haughey, Garden Horticulturist

Because we do not get enough rainfall to leach the nutrients out, our soil is generally more fertile than the soil of the Midwest or East. In fact, we have such an overabundance of some nutrients we have to remove them from the soil.

In more humid climates, lime is what people add to the soil to counteract acidity. In southern Arizona lime is everywhere, in the water, and in the soil. It often occurs as hard pan, or caliche. Luckily, most ornamentals do very well in the presence of lime. But lime and other salts occur in such excessive quantities in desert soils that they frequently need to be removed. This is most easily done by leaching.

Nitrogen is lacking in our desert soils because of the low amount of organic matter in the soil. Legumes such as acacia, palo verde, and ironwood do very well here because, with the help of some microorganisms, they provide their own nitrogen. For other plants, it is a good idea to add nitrogen to the soil. Ammonium sulfate is high in nitrogen, although you have to be careful not to add too much or you will burn your plants. Applying an organic mulch of compost, manure, sawdust or bark residue will add nitrogen without the danger of burning plants, although organic material must be well-rotted and have relatively reduced salt levels.

Phosphorous is also deficient in our soils. Superphosphate is high in phosphorous and is in a readily available form once it is in solution. Organic fertilizers also contain phosphorous, but it is not available to the plants until the organic matter decomposes.

Iron is frequently unavailable in our soil because the iron is tied up in insoluble salts. First symptom of iron deficiency is usually yellowing of leaves between the veins. Later the leaves turn brownand fall off, then the branches die back, and the plant dies. When roots become waterlogged from overwatering or poor drainage the plant cannot absorb iron and becomes chlorotic — the yellowing condition mentioned above. To add absorbable iron to the soil, apply iron chelates. The package label shows recommended amounts for use on calcarious soils.

If you are located on a reef of caliche you might consider moving. If that isn't possible here are a few other alternatives: you could backfill your yard with a few truckloads of decomposed granite, or remove the caliche with heavy equipment, or you could use plants with shallow root systems, such as many cactus. If you are lucky you might be able to poke a hole through the "hard pan" to allow the root system to enter the softer soil below. One helpful hint: if you have to dig through a caliche you might try softening it up by starting the hole or trench and letting water stand in the hole for a few days before you continue digging.

When buying chemical fertilizers you may notice a series of three numbers such as 21-53-0 displayed prominently on the bag. These numbers stand for the amounts of nitrogen, phosphorous, and potassium (in that order) in the fertilizer. Because our soils are deficient in nitrogen and phosphorous and contain sufficient potassium, a suitable all-round fertilizer for our soil should have a series of numbers such as 18-46-0, which indicates a high-strength ammonium phosphate.

But one of the best fertilizers is organic mulch spaded into the soil. It contains all the nutrients and micronutrients plants need. It also improves soil texture, water retention, and helps to prevent drastic temperature changes. For the home gardener it is the cheapest. You can make your own compost or buy manure from a farmer or commercial vendor. You are less likely to burn your plants with well-rotted fertilizer than with chemical fertilizer.

If you wish to learn more about the complexities of fertilizing your yard, two helpful books are "Soils of the Desert Southwest" and "Management of Southwest Desert Soils," both by Wallace H. Fuller and both available at our Bookstore.

Rock Nettle, *Eucnide urens* Parry

Many desert plants have sharp spines or poison to protect themselves from potential herbivores. **Eucnide urens** combines the two functions in the form of what appears to be soft pubescence. The leaves, stems and calyx are in fact hispid, being covered with short hairs bearing whorls of minute barbs, and longer straight stinging hairs up to 4 mm long. In addition, shorter, stiff but not pungent hairs are found mixed with the above two types.

I first noticed **Eucnide urens** on the steep wall of the arroyo at the east base of Planet Peak in Yuma County, Arizona. The accompanying photographs were taken at this site. It was growing in a horizontal slit in a huge block of weathered conglomerate at about the 600-foot elevation. This appears to be typical habitat, judging from comments from several sources. This habitat offers shade, uniform soil and moisture conditions, and few competitors. It is always found in canyons, never on the open mesas or plains. It is common in the northern Mohave Desert of Inyo and San Bernardino counties in California, eastward into Clark and Lincoln counties of Nevada and Washington County, Utah. It is also found from the Grand Canyon country of Arizona southward along the Colorado River into northern Baja California, Mexico.

E. urens photographed in late April. Note the hispid surface of the unopened buds.

Eucnide urens belongs in the Loasa Family. With the exception of one monotypic genus (**Kissenia**) of Africa and Arabia, the family of about 250 species is restricted to tropical and subtropical America. **Eucnide,** one of the 15 genera in the family, consists of 10 species, all from the southwestern United States and Mexico. Their closest relatives (with which some authors have synonymized them) are the common Mentzelias or Blazing Stars.

Eucnide urens is a suffrutescent herb to 1 meter tall, although plants less than half that size are most often encountered. Because the stout whitish stems are decumbent, spreading and ascending, the plants are often wider than they are tall. Leaves are of two types. The larger lower ones are alternate, irregularly and coarsely toothed, to 6 cm long and 5 cm wide. They are petioled, ovate to subcordate, and grayish green. The upper ones, usually those just below the terminal cymose inflorescence, differ in that they are often opposite, sessile, and clasp the stems.

The flowers although pale yellow or cream in color are most attractive because of their large size (6 to 7 cm across)

and terminal position. The ovulary is inferior, being sunken deeply into the receptacle. It consists of five united carpels with one locule and five placentae. Seeds are numerous. The stout five-cleft style raises the stigmatic surfaces beyond the anthers, which are turned inward and angled toward it. **Mentzelia** can easily be distinguished from **Eucnide** by examination of the style alone, **Mentzelia** having only three stigma lobes. Stamens are numerous, 1-2 cm long, and have bases fused to one another and to the corolla, forming a 2-mm-long inconspicuous tube. The corolla consists of five obovate petals, 3-4 cm long by 2 cm wide, with mucronate hispid tips. The corolla and stamens are caducus, falling as a whole as the fruit develops. The capsular fruits which develop from these flowers are 1-2 cm long, 8-12 mm wide, pediceled, erect and apically five-valved.

Eucnide urens is seldom cultivated, despite its handsome flowers. Its habitat requirements and stinging hairs tend to make it a difficult horticultural subject. One annual species, **Eucnide bartonioides**, is reported in L. H. Bailey's Standard Cyclopedia of Horticulture as being occasionally cultivated for its showy flowers.

REFERENCES

Coville, Botany of Death Valley

Munz, Flora of Southern California

Shreve and Wiggins, Vegetation and Flora of the Sonoran Desert

McDougall, Seed Plants of Northern Arizona

Kearney and Peebles, Arizona Flora

Bailey, Standard Cyclopedia of Horticulture

——RGE

This plant, growing in a crack on a vertical rock face, measured 40 cm in width and 30 cm in height.

BOOK REVIEW

In 1972, the first volume of an "Intermountain Flora" was published but no cognizance of its publication appeared in the columns of this "Bulletin". Two reasons prompted this omission. First, the range of this flora is limited in general terms from the western slopes of the Rockies to the eastern slopes of the Sierra Nevadas and the only area in Arizona included within its range is the Kaibab Plateau in the northwest corner of the State. Secondly, only two small groups of plants were treated in this volume and this insufficiency limited any evaluation of its scientific merit.

Now, the second volume in the series of six has been published and it satisfies all of the expectations aroused with the appearance of the first volume. Whereas Volume One was devoted mainly to a comprehensive geological and botanical history of the area, its plant geography, a glossary, and the treatment of the ferns, the fern allies, and Gymnosperms (cone-bearing plants), the second volume is devoted in its entirety to the Monocotyledons (grasses, sedges, and the Lily family). Its authorship is cooperative, one author on the staff of the Smithsonian Institution and the other four authors on the staff at the New York Botanical Garden, the institution responsible for its publication. All of the species are fully illustrated and most of the drawings were prepared by Jeanne R. Janish, an outstanding illustrator of Western plants. Each species is described in detail and in those instances where the status of a species is in doubt, a discussion of the problem is appended to the description. It is truly a comprehensive, thorough, professional study, and in the opinion of this writer its excellence establishes a new criterion by which future floristic manuals will be measured. If there is a fault, it is the cost, although it is printed on high quality paper. Volume One was issued at approximately seven dollars, but the cost of this second volume is fifty-four dollars, putting the cost of the entire set beyond the means of most taxonomic students, the group most in need of this addition to the flora of the West.

J. Harry Lehr
Curator of the Herbarium

News & Notes

(continued from page 99)

sant chance to meet each other as well as to meet our new volunteer co-ordinator, Alberta Pribula, if they hadn't already seen her volunteering in the library or the office, or wielding a paintbrush before the Botanical Print Show. Alberta's job is to keep our fine volunteers happy — she has already "demanded" equal time for volunteers to relax and have a cup of coffee in the staff lounge, and is defining new volunteer jobs so that future volunteers can choose work they like best.

It's Very Probable —

that you belong to a civic, gardening, alumni, activity or employees club besides belonging to the Desert Botanical Garden.

As a Garden Member, why not suggest that your club becomes a Member of the Garden?

The Garden enhances and serves the community, so it is logical for community groups to help support an institution that is a community asset.

Group Memberships offer special benefits to the club as a whole, as well as benefits to its members.

If you'd like to present this idea to your club, telephone the Garden for Group Membership details.

POISONOUS PLANTS IN ARIZONA

Most people don't spend a lot of time worrying about poisonous plants — and rightly so. Plant poisoning is usually an important consideration with only three groups of people: young children "browsing" around the yard, people practicing survival skills or "getting back to nature" who may mistake poisonous plants for wild edibles, and people who purposely eat poisonous plants for the psycho-active effect.

Most plants are not poisonous. Of the 4,000 species native to Arizona, only about 300 are even suspected of being toxic to man or livestock. So don't panic and cut down all your oleanders. Just be aware that some plants can be dangerous.

There are no reliable "rules" for determining in advance which plants are poisonous. Simply do not eat **anything** you are unsure of. Don't even try a bite to see how it tastes or what happens — one bite of poison hemlock can be fatal to an adult, and water hemlock reputedly tastes like parsnips. Eating only what you've seen animals eat is also not reliable — animals can sometimes eat plants that are toxic to people.

Below is a list of some of the more common or more dangerous poisonous plants of Arizona.

NATIVE DESERT PLANTS	**Poisonous Part**
Argemone platyceras—Prickly Poppy	All parts, esp. seeds
Astragalus species—Locoweed, Poison Vetch	All parts
Datura species—Sacred Datura, Jimsonweed	All parts
Lupinus species—Lupine	All parts, esp. ripe seeds
Nicotiana glauca—Tree Tobacco	All parts

NATIVE TO HIGHER ELEVATIONS IN ARIZONA

Cicuta douglasii—Water Hemlock	All parts, esp. fleshy roots
Conium maculatum—Poison Hemlock	All parts
Delphinium species—Larkspur, Delphinium	All parts, esp. seeds & young plants
Zigadenus species—Death Camus	All parts

CULTIVATED PLANTS GROWN IN THE VALLEY

Colchicum autumnale—Autumn Crocus	All parts
Dieffenbachia species (a houseplant)—Dumbcane	All parts
Gelsemium sempervirens—Carolina Jasmine	All parts
Lantana species—Lantana	All parts, esp. green berries
Nerium oleander—Oleander	All parts
Ricinus communis—Castor Bean	All parts, esp. young plants & seeds
Sophora secundiflora—Coral Bean, Mescal Bean	All parts, esp. seeds
Thevetia peruviana—Yellow Oleander	All parts

You should also avoid all plants near cultivated fields because of the possibility of pesticide poisoning.

If plant poisoning is suspected, call a Poison Control Center immediately. Save the suspected plant for identification.

Here are four telephone numbers of Poison Control Centers in the greater Phoenix area:

257-4545	Good Samaritan Hospital
252-5911	Memorial Hospital
277-6611	St. Joseph's Hospital
253-3334	St. Luke's Hospital

Next month I'll discuss the good part — what you **can** eat.

——SCK

A Native Flax, *Linum lewisii* Pursh

The Western Blue Flax has two intensely annoying characteristics. The flower drops its petals without any provocation, and seems to do it most deliberately if you look at it with the intention of collecting a specimen. And then, after you've been clever enough to sneak up behind it and trap a complete flower in your plant press, it will take revenge on you by disintegrating in the press before you get it home. The petals stick to the paper — try to unstick them and they crumble into scales, like butterfly wings.

The technical adjectives for these nasty qualities are "caducous" and "deliquescent", and the words have a fine vindictive ring when a botanist says them with feeling.

If, however, you simply want to admire it in the wild, Blue Flax has much to recommend it.

The stems that are one to two feet high have many small, narrow bluish-gray leaves, and are topped with loose clusters of inch-wide sky-blue flowers. The five fragile petals have a little yellow just at the base, and are delicately veined with darker blue.

Because the leaves are small, flax flowers look larger than they are.

Darker-blue veins are visible on the upper surfaces of the petals.

Our wild Blue Flax, **Linum lewisii**, bears a close resemblance to **L. usitatissimum**, the flax that linen has been made from for thousands of years. It has an even closer resemblance to the garden perennial Blue Flax, **L. perenne**, and indeed some authorities consider it a subspecies of **L. perenne** and not a separate species at all. In his **California Flora** (1959) Munz lists it as a subspecies, but in his more recent **Flora of Southern California** (1974) he gives it full-species status, and comments that **L. lewisii** resembles the European **L. perenne**, but there are strong breeding barriers between them.

Linum lewisii is a western wildflower that ranges from Alaska south to northern Mexico and east to Texas. In Arizona it can be found at 3500 ft. elevations and higher, commonly on mesas and in coniferous forests. It blooms from March to September, a long flowering season that is also characteristic of **L. perenne**.

Although it has typically long flax fibers, they are weaker than those of **L.**

usitatissimum. The Klamath Indians are said to have used this flax for cordage, but there is no evidence that any other native Americans found a practical use for the plant. In New Mexico, where it is abundant, settlers once made flaxseed poultices from the seeds, just as poultices were made from the seeds of linen flax in Europe and the eastern United States.

Frederick Pursh published the first description of the plant in 1817, and named it for Meriwether Lewis who collected specimens during the famous Lewis and Clark Expedition to the west.

REFERENCES

Arnberger, Flowers of the Southwest Mountains
Curtin, Healing Herbs of the Rio Grande
Kearney & Peebles, Arizona Flora
Munz, A California Flora
Munz, A Flora of Southern California

——LD

About Our Botanical Print

The mid-eighteenth century was a period of brilliant work by botanists, gardeners and artists, who produced a flood of important botanical and horticultural books.

Philip Miller was one of those gardeners, John Miller was one of those artists, and the botanical print the Garden has just published reproduces an **Agave americana** John Miller executed in 1758 for

Philip Miller's "Figures of the Most Beautiful, Useful and Uncommon Plants Described in the Gardeners Dictionary".

Philip Miller was once called "the prince of gardeners" by no less a personage than Linnaeus. At that time, a gardener was not just the man who mowed the lawn. He was a horticulturist, experimenter, director, and often a writer. Miller brought the Chelsea Physic Garden to world renown and introduced hundreds of new plants not only to Chelsea but to other botanical gardens in Europe and America. He was a member of the Royal Society and of the leading European societies as well.

From 1724 onward he wrote and published reference works that were highly regarded in the world of botany. Foremost among them was the monumental Gardeners Dictionary, published in 1731 and regularly revised in the light of new botanical knowledge. His eighth edition is still of use to botanists. It is estimated that the scientific names of more than 600 plants, and the original descriptions of more than 300 were first published by Philip Miller.

The Gardeners Dictionary, except for a frontispiece, was not illustrated, but between 1755 and 1760 Miller published in 50 parts (later in two bound volumes) "Figures of the Most Beautiful, Useful and Uncommon Plants Described in the Gardeners Dictionary". The lavish work contained 300 hand-colored copper engravings by the best botanical artists that the influential Miller could employ.

Most of the plates fit the $9\frac{1}{2}$x$12\frac{1}{2}$ page size, but Plate 222, the American Agave, was important enough to merit the use of a twice-folded insert page, so this one plate is $20\frac{1}{2}$ inches long and slightly more than 9 inches wide. (The Garden has reproduced it in its original size on a sheet 23 inches long and 18 inches wide.)

John Miller, the artist, was no relation to Philip Miller, the publisher. He was born Johann Sebastian Muller in Nuremberg, and anglicized his name when he moved to London in his early years. As a botanical artist, he is considered second only to Ehret. The plates he made for Linnaeus caused the botanist to speak of Miller's work as "more beautiful and more accurate than any since the world began". The seventeen books to which he contributed all or part of the illustrations include six of which he was author, illustrator and publisher.

The reasons for our choice of this particular print for reproduction aren't hard to find. It is an important print from an important book, a very attractive picture, and since our Garden's symbol is an Agave, it was a natural choice.

There were some problems in achieving a meticulous reproduction of the 1758 print. The paper had become fragile over the years, especially at the two creases where it had been folded, and there was a certain amount of foxing — the brownish-yellow discoloration that often develops on old paper. But with the use of ultra-modern electronic scanners by the company who made the color separations, and a certain amount of additional handwork by their technicians, the crease marks were made nearly invisible and the foxing was eliminated. Then we had the services of a highly skilled printer, who found a paper that is almost identical to the original in color and texture, and who saw to it that the reproduction was printed in colors that exactly matched the original. (We are most grateful to Scott Whittaker of Land o'Sun Printers for his continued insistence on fine and accurate printing.)

You will find the Garden's reproduction of Miller's Agave **americana** not only has the same dimensions as the original, but also has the same "feel", the quality of being right in every way.

If these notes have omitted the fact that this is a very decorative picture, you have only to look at the photograph. Better still, come to the Garden and look at the framed original and the framed reproduction side by side.

DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

NOVEMBER

CACTOMANIACS meeting. November 2nd, 8 p.m.
MEMBERS' FIELD TRIP to Four Peaks. November 19th, 8 a.m.
MEMBERS' PREVIEW of the "Spirit of the Desert" Art Show. November 23rd, 7 to 9 p.m.
ART SHOW opens on November 24th and runs through December 4th, 9 a.m. to 5 p.m.
FIELD TRIP (open to the public) to South Mountain Park. November 26th, 8 a.m.

DECEMBER

CACTOMANIACS meeting. December 5th, 8 p.m.
WORKSHOP—CHRISTMAS DECORATIONS. December 9th, 9:30 a.m. to 2 p.m.
MEMBERS' FIELD TRIP to Horseshoe Dam. December 10th, 8 a.m.
CLASS IN FIELD IDENTIFICATION—an intermediate course in desert plant identification. Fees include books and hand lens. December 13th through January 17th, 2 p.m.
WORKSHOP—CHRISTMAS DECORATIONS. December 15th, 9:30 a.m. to 2 p.m. (A repeat of the December 9th workshop)
FIELD TRIP (open to the public) to the McDowell Mountains. December 17th, 8 a.m.

For class fees, field trip reservations and other information, telephone 947-2800 or 946-9942.

The Garden is open every day of the year from 9 a.m. to sunset.

Books
Seeds
Et Cetera

available from the
Desert Botanical Garden Bookshop

Prices listed include handling and postage to United States addresses. Add 10 per cent for all foreign orders. Check or money order must accompany order. All books published in hard cover unless otherwise specified.

Mailing address: P.O. Box 5415, Phoenix, Arizona 85010. Telephone: (602) 947-2800.

NEW BOOKS

American Indian Food and Lore, Niethammer. 191 pp., soft cover. $5.45
Old and modern uses of native food plants, collected by the author from the women of seven Arizona tribes. Of interest to ethnobotanists and cooks.

The Boojum and Its Home, Humphrey. 214 pp., illustrated, soft cover. $9.45
Readable, botanically accurate account of *Fouquieria (Idria) columnaris* and its habitat in Baja California.

Cacti & Their Cultivation, Martin, Chapman and Auger. 205 pp., illustrated, soft cover. $6.20
Helpful for the beginner and not-quite-expert.

Cacti of the Southwest, Weniger. 249 pp., 64 pp. color plates. $26.00
Although it does not cover all Arizona and southern California cactus, a fine book. Excellent descriptions and color photos of each species.

The Complete Book of Flower Preservation, Condon. 210 pp., photographs. $8.45
A carefully detailed book by an acknowledged expert.

The Desert, Butcher. 128 pp., 69 color plates. $18.70
A photographer's best photos of desert scenes from Oregon to Texas.

Gardening Under Artificial Light, Brooklyn Botanic Garden 65 pp., illustrated, soft cover. $1.75
Exceptionally complete for such a small book.

Growing the Mesembs, Storms, 26 pp., color plates, soft cover. $3.75
Some have slight but important differences in their requirements. The author gives detailed information. Superb color photos of 48 different species of Lithops.

An Illustrated Guide to Arizona Weeds, Parker. 338 pp., line drawings, soft cover. $7.00
Originally written for ranchers, but also useful for field botanists and gardeners.

In the Magic Land of Peyote, Benitez. 198 pp., illustrated. $10.25
Translation of an important account of the Huicholes' traditional uses of peyote.

Landscaping with Native Arizona Plants, Natural Vegetation Committee, Arizona Chapter, Soil Conservation Society of America. 194 pp., photographs, soft cover. $5.45
Complex, but thorough. Mainly directed toward institutions and agencies.

Management of Southwestern Desert Soils, Fuller. 195 pp., photographs, maps, tables, soft cover. $8.00

A "how-to" book on desert soils for gardeners, farmers and other land management professionals. Dealing with the problems generated by the unique nature of Southwestern desert soils.

Mineralogy of Arizona, Anthony, Williams and Bideaux. 255 pp., color photographs, line drawings, soft cover. $10.00

Magnificent photography of the major crystals, combined with line drawings, maps, locations, bibliography and expert commentary and chemical formulae.

Native Trees and Shrubs for Landscape Use in the Desert Southwest, Sacamano and Jones. 40 pp., photographs, soft cover. $1.75

Highly recommended. Cultural information, photographs of mature plantings.

The Plant Doctor, Nicholls. 108 pp., soft cover. $4.20

How to diagnose house plant problems.

Reptiles and Amphibians of the American Southwest, Heymann. 77 pp., color photographs, maps, soft cover. $5.20

The photos and the brief descriptions make identification easy.

Shrubs and Trees of the Southwest Uplands, Elmore. 214 pp., illustrated, soft cover.

Easy to use field guide for the four distinct life zones in the Southwest above the desert elevations.

Soils of the Desert, Fuller. 102 pp., illustrated, soft cover. $5.45

Biology, physics and chemistry as they affect the development and nature of desert soils. Includes analysis of nutrient cycling.

A Vegetative Key to the Cultivated Woody Plants of the Salt River Valley, Arizona, Pinkava and Lehto. 72 pp., soft cover. $3.20

Covers all plants commonly grown in the area. Good for identifying ornamentals.

The Vertebrates of Arizona, Lowe. 270 pp., soft cover. $5.50

A thorough distributional list of all species in the state.

Water, Light & Love, Milstein. 96 pp., soft cover. $4.20

A guide to growing indoor and outdoor plants from seed.

Woody Plants of the Southwest, Lamb. 177 pp. illustrations, maps, soft cover. $9.45

Covers New Mexico and Arizona and parts of adjacent states. Distributional maps particularly useful.

ABOUT CACTI & SUCCULENTS

The Book of Cacti and Other Succulents, Chidamian. 258 pp., illustrated. $7.45

An excellent popular book. The comparative drawings are a great help.

The Cactaceae, Britton and Rose. Reprint, 2 volumes, 1048 pp., illustrations. $35.75

A classic that will always be a positive reference. Originally in four volumes, now available in a reprint of two volumes.

Cacti, Borg. 448 pp., illustrations. $10.00

The only one-volume work containing most of the species of cactus. Invaluable for the ardent amateur and keen student. Plant descriptions are non-technical.

The Cacti of Arizona, Benson. 218 pp., color plates, line drawings, maps, soft cover. $8.25

Revised, third edition. A necessary book for the researcher and botanist.

***Cactus and Succulents and How to Grow Them,** Haselton. 64 pp., illustrated, soft cover. $1.00

Over 100,000 of these inexpensive booklets have been printed for the aid of the beginner. 200 common names are included.

*Garden publication, subject to library and dealer discounts.

Colorful Cacti of the American Deserts, Lamb. 236 pp., color plates, maps. $6.20

Based on the Lambs' personal visits to the land of the cacti they have studied and grown for years.

Handbook on Succulent Plants, Brooklyn Botanic Garden. 69 pp., color and b&w photographs, soft cover. $1.75

A helpful booklet by specialists in their various fields.

How to Know the Cacti, Dawson. 158 pp., illustrated, spiral bound. $5.20

One of a "pictured key" series, best on distinguishing Opuntia species.

The Observer's Book of Cacti & Other Succulents, Scott. 159 pp., color and b&w photographs. $3.20

A small book with emphasis on the great variety of cactus and other succulent plants.

Pocket Encyclopedia of Cacti in Colour, Lamb. 217 pp., color plates. $6.20

A well-written small book for the succulent fancier.

Popular Exotic Cacti in Colour, Lamb, 176 pp., 100 color plates, maps. $7.20

100 species of cactus and other succulents, fine photos, descriptions and cultivation notes for each.

FLORAS—FIELD GUIDES—GARDENING

The Agave Family in Sonora, Gentry. 195 pp., illustrated, soft cover. $3.25

By the acknowledged authority on the Agave.

The Agaves, Breitung. 108 pp., photographs, soft cover. $5.20

Horticultural information for the Agave fancier.

Arizona Flora, Kearney and Peebles. 1032 pp. $22.75

The essential flora, and a good one.

Colorful Desert Wildflowers of California and Arizona, Ward. 140 pp., illustrated, soft cover. $5.00

Attractive color photos. A field guide.

Desert Wild Flowers, Jaeger. 322 pp., line drawings, soft cover. $3.45

A most useful book in Arizona, although emphasis is on California deserts.

A Field Guide to the Common and Interesting Plants of Baja California, Coyle and Roberts. 206 pp., color photographs, soft cover. $9.00

A very good book, fine illustrations, some data on plant uses. Also helpful in Arizona and southern California.

Flowers of the Southwest Deserts, Dodge
Flowers of the Southwest Mesas, Patraw
Flowers of the Southwest Mountains, Arnberger

Each volume 112 pp., line drawings, soft cover. per vol. $1.75

All three have proved exceptionally useful to newcomers and are in constant use by Arizonans as well. Arranged by flower color and simple to use.

Practical Gardening in Southern Arizona, Valley Garden Center. 82 pp., soft cover. $2.25

In print, and well used, since 1940.

Vegetation and Flora of the Sonoran Desert, Shreve and Wiggins. 2 vols., 1740 pp. $40.50

Research, exploration, and preparation for over thirty years resulted in this fine work on the plant life of the Sonoran Desert, which is treated in complete detail.

ABOUT THE DESERT

50 Hikes in Arizona, Nelson. 50 pp., maps, soft cover. $2.75

Useful, detailed information for long hikes in unfamiliar areas.

Birds of North America, Robbins et al. 340 pp., hard cover $6.45
color plates, maps. soft cover $4.45

As popular as Peterson with birders in the Southwest.

Birds of the Southwestern Desert, Smith, 69 pp., colored line drawings, soft cover. $4.20

An introduction to our most common birds.

Field Guide to Western Birds, Peterson, 244 pp., colored and b&w plates. $7.45

Current edition of an essential field guide.

Mammals of the Southwest Deserts, Olin. 102 pp., line drawings, soft cover. $1.75
Forty-two of the most common mammals and their habits.

Meet the Southwest Deserts, Welles. 84 pp., illustrated. $5.00
An introduction to deserts and desert life.

Poisonous Dwellers of the Desert, Dodge. 48 pp., illustrated, soft cover. $1.00
Snakes, spiders, scorpions and Gila monsters.

Supersition Wilderness Guidebook, Sheridan. 60 pp., photographs, soft cover. $3.00
A trail guide to the famous sites of the accessible parts of the Superstitions, with introductions to the geology and biology of the area.

USING PLANTS

Common Edible and Useful Plants of the West, Sweet. 64 pp., line drawings, soft cover. $2.75
Emphasis is on early uses of the major plants.

Dye Plants and Dyeing, Brooklyn Botanic Garden. 100 pp., photographs and line drawings, soft cover.
Natural Plant Dyeing, Brooklyn Botanic Garden. 64 pp., photographs, soft cover.
These are good introductions to the craft, using easily available materials. per vol. $1.75

Wild Edible Plants of the Western United States, Kirk. 306 pp. plus indices, line drawings, soft cover. $5.25
Covers the area very thoroughly, good drawings. Handy size for field use.

COOKBOOKS

Arizona Cookbook, Fischer. 144 pp., soft cover. $3.25
A sampling of recipes from different cultures, nothing very exotic.

Cactus Cook Book, Tate. 128 pp., soft cover. $2.25
Fun to read. Includes some native uses of cactus and succulents as foods, a number of oddities.

Western Mexican Cook Book, Paine and Carruthers. 65 pp., soft cover. $1.75
Authentic recipes from the northern and western states of Mexico. The real taste.

SEEDS

The Desert Botanical Garden offers only fresh seeds packaged at the Garden. Planting directions are printed on each seed packet. Cactus seed packets contain approximately 250 seeds in each.

Arizona Cactus Mixture — Organ Pipe, Hedgehog, Barrel, Saguaro, Queen of the Night Cereus, Pincushion $0.60

Mexican Cactus Mixture — Golden Barrel, Octopus, Bishop's Cap, Organ Pipe, Hedgehog, Indian Comb. $0.60

Saguaro *(Cereus giganteus)* $0.60

African Daisy *(Dimorphotheca aurantica)* $0.35

Mixed Wildflowers $0.35

Desert Poppy *(Eschscholtzia mexicana)* $0.35

Beardtongue *(Penstemon parryi),* dark pink $0.35

ET CETERA

The Desert Botanical Garden T-SHIRT is tan cotton with the Garden's stylized Agave design printed in red and shades of green. Sizes available:

Adults—S, M, L, XL $5.45
Children—S, M, L $4.45

The Desert Botanical Garden SHOULDER PATCH is embroidered with the Garden's Agave in red and shades of green on a gold background. $2.10

New--and Very Special

OUR POSTER. The Desert Botanical Garden's Agave symbol (Century Plant) in greens and red on a buff background, 22x34 inches. Postpaid, $3.50

A FINE BOTANICAL PRINT. A reproduction of John Miller's 1758 hand-colored engraving of Agave americana in flower. Limited and numbered edition in full color, original size, 18x23 inches. Published by the Desert Botanical Garden. Postpaid, $10.50

ARIZONA FLORA SUITE. A portfolio of eight signed drawings of Arizona plants by botanical artist Wendy Hodgson. Edition limited to 100 numbered sets. Print size 18x20 inches. Postpaid (insured), $100.00
(Subjects: Saguaro, Opuntia, Mesquites, Palo Verdes, Sacred Datura, Ocotillo, Agave deserti, Jojoba)

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SAGUAROLAND BULLETIN

DECEMBER, 1977

SAGUAROLAND BULLETIN Editor, Lillian Diven

DECEMBER, 1977 Vol. XXXI No. 10

DESERT BOTANICAL GARDEN

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ARIZONA CACTUS AND NATIVE FLORA SOCIETY

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News & Notes

The Garden and the Salt River Project are sponsoring the "ARID"-zona Beautiful program which will give recognition to outstanding landscaping using drought-resistant plants. Private homes and other residential buildings, and industrial, commercial, and municipal sites are eligible for the program. Nomination forms are available at the Garden, the Salt River Project, and at banks and savings institutions.

The program will "identify and give recognition to organizations and individuals who have had the foresight and concern for limited resources to use drought-resistant plant materials in their landscaping design." Both the landscaping design and the authenticity of the plant material will be considered in the judging.

* * *

In the last issue of the Bulletin Khrybel Amberg was incorrectly referred to as chairman of the Spirit of the Desert Art Show. She was actually a very able member of the advisory group invited to assist the staff with the show.

* * *

Alice Feffer has given the Garden a gift of sculpture — "Trees" by Henury, a Rhodesian artist. The gift is on display in the library.

* * *

Students in Hank Giesecke's Navaho weaving class have all completed sample rugs — some of them working on looms they built themselves. Using hand-spun yarn the students, instructed to "bring a pillow to sit on," worked at their looms out on the patio each Saturday.

* * *

The Garden thanks the Chevrolet Motor Division of General Motors Corporation for the use of a nine-passenger 1978 Suburban for use on the field trip to Four Peaks.

* * *

If you purchased plants at the Garden's plant sale last spring Charles Merbs would like to hear from you. He's preparing a report for the Bulletin about the sale and needs to know about the plants you purchased. Any surprises? Disappointments? Please get in touch with him — either a note sent to the Garden or a phone call to 839-4068.

(continued on page 117)

DRIP IRRIGATION — How It Works

by Del Murphy

Methods of drip irrigation are being talked about a lot nowadays because of the growing awareness of the need to use water wisely. Drip systems conserve water by delivering water only to the plant area and by reducing water loss due to evaporation.

Drip systems can be designed for such diverse uses as home vegetable gardens, grass areas, ground cover, commercial field crops, plant nurseries, highway landscaping, parks and desert plantings. Drip system components vary, depending on purpose and location. Emitters are available which deliver water in amounts from ½ gal. per hour to 4 gal. per hour. There are above-ground emitters and below-ground emitters. Some emitters are pressure-compensating so that the plant at the bottom of a hill receives the same gallons-per-hour as the plant at the top. Trickle tapes that use only drops of water, and are buried, are used for vegetable gardens and turf. Plant nurseries use small-sized tubing alone or with stitched loops for individual containers. Most drip systems require a regulated low pressure and filtered water, so filters and regulators are important parts in a system. All parts are made of plastic which require no glue to install.

In addition to saving water, drip systems help the landscaper, homeowner, and farmer to have healthier plants with less maintenance. Drip systems are helpful to plant growth because the water is directed to the root zone and a constant level of moisture can be achieved. Few weeds grow because large areas are not flooded. Since no wells for watering are needed around trees or plants, landscapes can be natural. This is especially helpful in desert landscapes. Plants can be grown on mounds, in rocky areas, and in washes. In public areas, underground drip emitters mean less breakage replacement because of vandalism. With drip irrigation no water is blown or washed over sidewalks or streets. Fertilizer can be applied through the watering system. The system can be automated by the use of clocks or moisture-sensors. It is easy to add to a drip watering system as plants are added.

Drip irrigation methods have been studied and modified since drip was developed in Israel in the 1950s. This is a water-wise way to achieve attractive landscaping and healthy crops and plants.

DRIP IRRIGATION AT THE GARDEN

For the last four years we have had a drip system in use in our Australian Section (which will be open to the public in a few years, when the plants are larger).

The whole cost of the system, which waters close to 250 plants, was about $200.00. It probably saves the Garden $100 a week for the labor it would take to water all those plants.

This week we have been working on installing drip systems in most of our flower beds. The equipment needed for all the beds cost about $150.00. These new drip systems will water with a turn of a valve what used to take one person two days to water.

Installation is very easy. All the fittings just screw together and the plastic hose only needs to be buried a few inches below the surface of the soil to protect it from the decaying effect of our sun. Very little muscle is required for installation.

The low cost, ease of installation, the labor saved and the water efficiency make drip irrigation almost a "must" for desert gardens.

When you decide to change to drip irrigation in your own garden, your salesman can recommend the best emitters and other equipment for your particular needs, and he can

tell you how to install the system yourself. Or you can have it installed for you.

Look in the Yellow Pages under "Irrigation." You may have to call around to find a company that sells drip irrigation systems — the listings aren't all that clear — but don't get drip irrigation confused with sprinkler irrigation.

—Russell Haughey

Mr. Gold's Twice-Found Cactus

In March 1968 the Garden received two specimens of a dwarf Mammillaria of unknown affinities as a gift from Mr. Charles Glass and Mr. Dudley Gold. The plant was first seen by Mr. Gold fifty years earlier, shortly after he had moved to Mexico. The publication of the dwarf **Mammillaria saboe** in 1966 prompted him to write to Mr. Glass and Mr. Robert Foster, informing them of the miniature Mammillaria he had discovered in 1918. Mr. Glass and Mr. Gold planned a trip to the original site, an area east of Nacozari, to collect more of the interesting miniatures, and to ascertain their relationship to **M. saboe.**

Mr. Gold had planted his original specimens in his garden at Nacozari, and had maintained them in excellent condition for twenty years, during which time they flowered freely. Then he moved to Mexico City, leaving the plants behind.

The original location has been reached by horseback in 1918. In 1968, while searching for it, this time by car, Mr. Gold and Mr. Glass came upon thousands of dark pink crocus-like flowers on the volcanic tuff hills bordering the road. They were the flowers of the sought-after plant!

The plant was described in the summer

The pink flowers are the most striking features of the plant.

of 1968 by Foster and Glass and named **Mammillaria goldii** after the discoverer. The plant itself is solitary or occurs with only a few heads, and in the wild is reported to actually pull itself below the pebbled ground surface during extended dry periods. The heads reach about 30 mm in diameter in cultivation. They are subglobose, or in our cultivated specimens tending toward cylindrical, and up to 7 cm long. The stem is continuous with the thick fleshy fusiform tap root.

The tubercles are terete and reach up to 7 mm long on our specimens. These terminate in pear-shaped areoles which radiate 35 - 45 slender, white, stiff pectinate spines. There are no centrals.

The intensely pink flowers are the plant's most striking features. They are normally much larger than the plant body, being over 30 mm wide and funnel-form. In the wild the long scale-less tube, lifting the blossom above the surrounding ground, allows pollinators to find the plant without exposing the plant as a whole to herbivores.

The fruits which develop from these remarkable flowers develop inside the plant body. The seeds remain inside the plant until the point where they are located is abraded or otherwise weathered open. Only then are they dispersed, and it may be a matter of years before one season's seeds leave the parent plant. A single plant may contain seeds from several years of flowering and setting fruit.

Other Mammillarias, especially in the Section Phellosperma of Reid Moran, also have this fruiting characteristic. However, our local member of this section, *Mammillaria tetrancistra,* does not. It has a typical clavate, protruding fruit. It does share the character of having large seeds (to 1.5 mm long) with an enlarged hilum.

The funnelform flowers are lifted above the ground-level plant.

The accompanying photos were taken a scant three weeks after the plants arrived at the Garden. They have continued to prosper, flowering each year. No seed has, as of this date, weathered out. It is reported in the article accompanying the type description that the seed is difficult to germinate. It is suggested also that the seeds have a prolonged after-ripening dormancy factor which must be overcome before germination can take place. Our plants are potted in coarse granite with a mulch of half-inch diameter cinders. Although the plant is well worth cultivating for its flowers alone, the interesting seed morphology and dispersal mechanism also contribute to its desirability.

Much of the information concerning the discovery of the plant was extracted from the article accompanying the type description published in the Cactus and Succulent Journal, Volume XL, Number 4, July-August 1968.

—RGE

Palo de Brasil, *Haematoxylon brasiletto*

Well-dressed gentlemen and ladies of the late 15th century wore velvets, furs and embroidery, but to 20th century eyes their wardrobes would seem drab. Their choice of colors was generally limited to blacks, tawny yellow-browns and some gray-blue shades. Reds and purples did exist, but the supply of fast dyes in these colors was minute, and most of it was required for ecclesiastical vestments and royal robes.

There are twelfth century European records of a true red dye made from the heartwood of *Caesalpinia sappan,* which was imported from Ceylon and the Indies, half the world away. It was a beautiful red, the color of burning coals (in old French and English "braise") and was called bresil or brasil.

The difficulty of importing brasil over the long trade routes from the East made it worth its weight in gold, and restricted its use to the very rich when it was available at all during the next three centuries.

Then, on the heels of Columbus, Portugal began to send ships to the New World, venturing farther south in search of new lands. In 1500, Portuguese ships discovered and claimed the part of South America that straddled the equator and bulged into the South Atlantic. It was first called Vera Cruz, but almost immediately the name was changed to Brazil, for not one but several kinds of the precious dyewood grew there in abundance.

It's hard to realize today how much brazilwood was coveted. We think of pirates as capturing cargoes of gold and jewels, but corsairs from Honfleur and Dieppe raided the coast of Brazil for cargoes of dyewood, and even attacked Portuguese vessels on their way home from South America.

The discovery of aniline dyes in the mid-nineteenth century ended the dyer's dependence on natural dyestuffs for the most part, and true, fast red dyes came

Haematoxylon brasiletto is a leguminous shrub or small tree.

from the laboratory from that time on. But brazilwood was not completely abandoned, as we shall see.

Haematoxylin is the dyestuff found in several species of Caesalpinia from Asia and the Americas, and in several species of the genus Haematoxylon from Brazil, the West Indies and Central America. The name Haematoxylon means bloodwood.

Haematoxylon brasiletto (Brazilwood or Palo de Brasil) is the principal Mexican source of the dye. It is a small leguminous shrub or small tree that grows in the lowlands of Sonora and Chihuahua, south into Guatemala and to Colombia. In frost-free areas of the Thorn-Forest and Short-Tree-Forest zones of Mexico, which oc-

cupy a north-south stretch of land inland from the Pacific coast, *H. brasiletto* is abundant.

It can become a small tree, up to 20 feet tall, but is usually an extremely dense hemispherical shrub with zigzag branches bearing rigid spines. The dark green compound leaves have comparatively large and round leaflets. Racemes of small yellow flowers appear in spring and fall, or after a heavy rain. The bark is reddish on young branches, turning gray. Long creases the length of a stem give a false impression of two or three stems fused together.

H. brasiletto was known by the Aztecs (it is illustrated in the Badianus Manuscript) and is still sold in Mexican markets, according to Martinez, for making mouthwashes.

In the recent past it was also used commercially in dentifrices, and may still be. Pink toothpastes are on the market today.

The Tarahumara Indians of northwest Mexico have never stopped using Palo de Brasil. The baton of their leader, the gobernador, is made of the wood, a decoction of the young branches is applied to the skin of persons suffering from jaundice, and Palo de Brasil is used to dye woolen threads for the sashes worn by every Tarahumara man.

Modern craftsmen who wish to use this historical dyewood can find it today in the catalogues of dealers specializing in natural dye materials.

Racemes of small yellow flowers appear in spring and fall after heavy rains.

But the most important use of *H. brasiletto* in the 20th century is as a biological stain for laboratory microscopy. There is no commercial substitute for haematoxylin. It is indispensible in the histological laboratory, easily taken up by cell structures, so that details can be clearly observed under the microscope.

Kings and churchmen no longer wear brasil-dyed robes, but the dyewood is still an article of trade today.

The accompanying photographs were taken of one of the three remaining *H. brasiletto* plants in the Garden. It is very frost tender. Our specimen is some fifteen years old, is in a very protected spot, but could still be killed by a heavy freeze. Unless you live in a completely frost-free area, it would be futile to hunt down a specimen for your own garden.

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—LD

Long creases in the branches give them the appearance of fused stems.

News & Notes

(continued from page 111)

New Garden Member Lucille Martindale of Scottsdale deserves a special welcome. As a tourist from Columbus, Ohio, she had visited the Garden. As a new Arizonan, she came to the Garden, became a member, and signed up as a Volunteer — **before** her furniture arrived from back home!

* * *

Garden Members and their guests viewed some 160 works of art at the Members' Preview of the "Spirit of the Desert" Art Show on November 23. All of the entries will be on display in the auditorium through Dec. 4.

* * *

Members of the Docent Training Class will be working at the art show. After the show closes, they are planning at least two more classes before they begin serving as tour guides.

Arizona's Edible Plants

by Sherry C. Krummen, Education Director

Below is a list of some of the more common wild edible plants to be found in Arizona. I've divided them into two groups — those that are pleasant-tasting and worth trying, and those that should be considered only as survival food, because they don't taste so good or because they are protected in Arizona.

PLEASANT TASTING

Cereus giganteus. Saguaro. Fruit edible—raw or made into syrup or wine.

Opuntia phaeacantha, Prickly Pear. Fruit and young pads edible—fruit raw, juiced or jellied; pads peeled, boiled and added to chile or stew.

Lycium species. Tomatillo. Fruit edible—raw or jellied.

Celtis pallida. Hackberry. Fruit edible—raw, jellied or added to breads; very seedy; some years they taste better than others.

Sambucus neomexicana. Elderberry. Cooked fruits edible—juice jelly or wine.

Prosopis velutina. Honey Mesquite. Pods edible—seeds hard and indigestible—try chewing the sweet pods—some trees have better flavored pods than others.

Salvia columbariae. Chia. Seeds edible—these are the seeds sold as health food—a teaspoonful added to cereals adds a nice flavor and is nutritious.

Olneya tesota. Ironwood. Seeds edible—raw or roasted—taste like soybeans.

Simmondsia chinensis. Jojoba. Seeds edible—raw or roasted—have slightly bitter taste.

Cucurbita species. Coyote Melon. Seeds edible—fry in butter—taste like pumpkin seeds.

Sisymbrium irio. London Skyrocket. Young leaves edible—eat as greens, peppery taste; many other wild mustard greens are edible—**Lepidium, Brassica, Rorippa** (Watercress), etc.

Typha latifolia. Cattail. Peeled root and white leaf bases edible—raw or cooked.

Agave species. Century Plant. Base of flower stalk and heart of plant edible—roast for several hours, tastes like squash; some people allergic to raw plant.

Portulaca species. Purslane. Whole plant edible—raw or cooked.

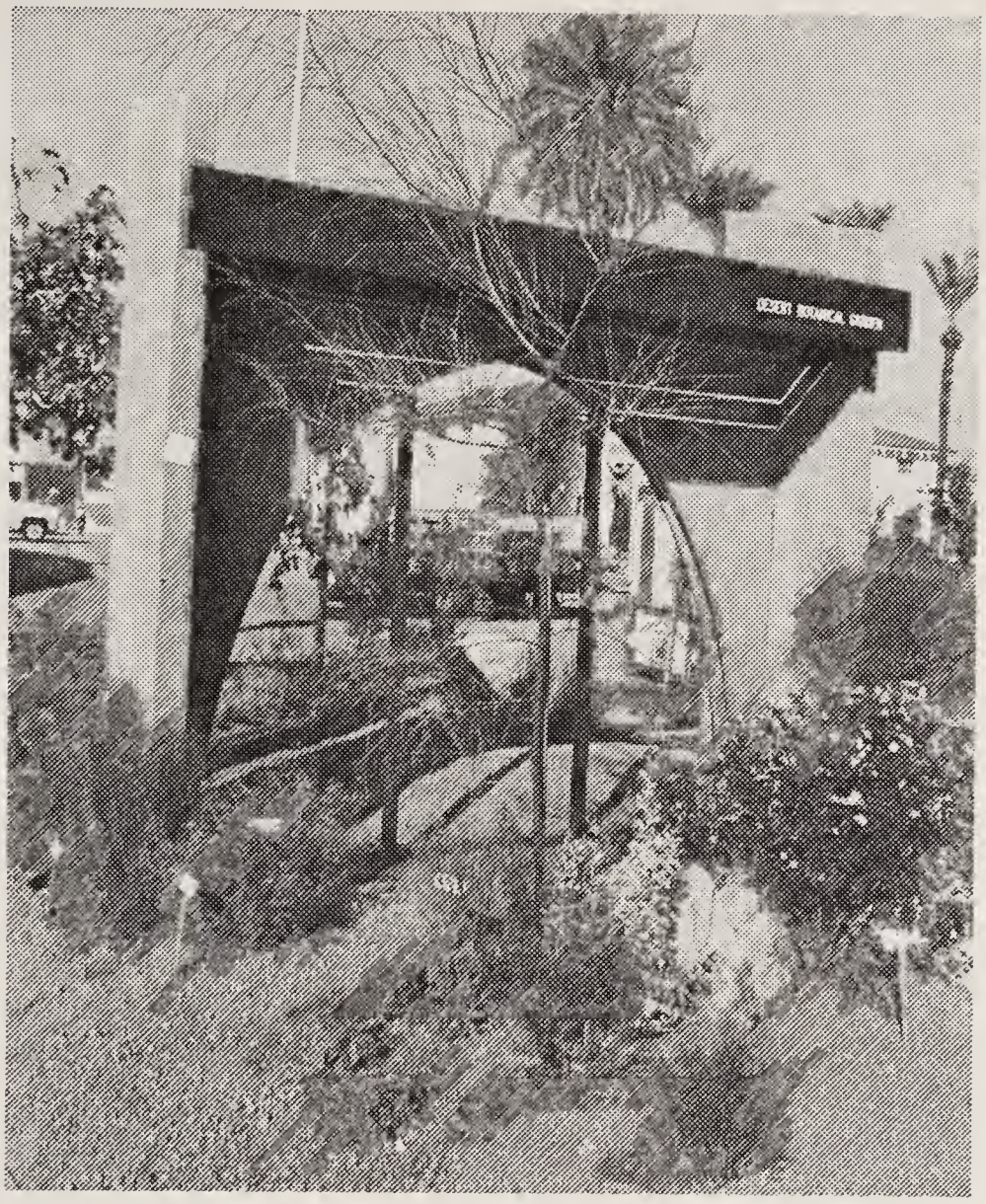
Amaranthus species. Pigweed. Young leaves—cooked, taste like spinach; eat only in moderate amounts.

Beloperone californica. Chuparosa. Flowers edible—raw, taste like cucumbers.

SURVIVAL PLANTS

Cercidium species. Palo Verde. Seeds edible.
Acacia greggii. Catclaw. Pods edible.
Plantago species. Plantain. Seeds and young leaves edible.
Quercus species. Oak. Acorns edible (contain tannin—eat in small amounts).
Yucca species. Yucca. Fruit of **Y. baccata** edible, only flowers of other species edible.
Cirsium species. Thistle. Roots edible.
Dichelostemma pulchella. Blue Dicks. Bulbs edible.
Peniocereus greggii. Arizona Queen of the Night. Tuberous root edible.
Opuntia species. Chollas. Buds edible.

Prize-Winning Garden



The Garden's demonstration of how drought-resistant plants can be used to achieve attractive landscaping won first prize at the Arizona State Fair. Plants from the arid regions of Arizona and Australia were combined to produce the award-winning garden shown above.

* * *

Christmas Gifts from the Garden

Do your Christmas shopping at the Desert Botanical Garden! There is one gift that you can buy only here and that's a very special present for the whole family to enjoy every day of the New Year – a Desert Botanical Garden membership.

In the store at the Garden you'll find something for everyone on your list. Among the offerings are: tote bags, T-shirts, and posters bearing the Garden's striking logo; books on many subjects (there are lots of new titles); limited edition prints of a 1758 drawing of Agave Americana; and edibles derived from desert plants.

And where would shopping be more pleasant? When all the gifts are purchased you can have a relaxing walk in the Garden. Remember too that each time you give a gift **from** the Garden you also give a gift **to** the Garden.

DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

DECEMBER

CACTOMANIACS meeting, December 6th, 8 p.m.
WORKSHOP—CHRISTMAS DECORATIONS, December 9th, 9:30 a.m. to 2 .m.
MEMBERS' FIELD TRIP to Horseshoe Dam. December 10th, 8 a.m.
CLASS IN FIELD IDENTIFICATION—an intermediate course in desert plant identification. Fees include books and hand lens. December 13th through January 17th, 2 p.m.
WORKSHOP—CHRISTMAS DECORATIONS, December 15th, 9:30 a.m. to 2 p.m. (A repeat of the December 9th workshop.)
FIELD TRIP (open to the public) to the McDowell Mountains. December 17th, 8 a.m.

JANUARY

CACTOMANIACS meeting. January 3rd, 8 p.m.
HOUSEPLANTS FOR PHOENIX, A four-session class, January 4th, 11th, 18th and 25th, 2 p.m.
FREE PUBLIC LECTURES, In the Garden's Auditorium, January 15th, 12th and 19th, 3 p.m.
MEMBERS' FIELD TRIP to First Water. January 14th, 8 a.m.
PRUNING WORKSHOP for desert gardeners. January 21st, 9 a.m. to noon.
MEMBERS' PREVIEW of the "Deserts of the World" Photography Show. January 27th, 7 p.m. to 9 p.m.
PHOTOGRAPHY SHOW opens on January 28th and runs through February 5th, 9 a.m. to 5 p.m.
FIELD TRIP (open to the public) to Picacho Peak. January 28th, 8 a.m.

For class fees, field trip reservations and other information,
telephone 947-2800 or 946-9942

The Garden is open every day of the year from 9 a.m. to sunset.